MOLLUSKS
NOV
5527

NOVAPEX

MCZ
LIBRARY
APR 15 2010
HARVARD
UNIVERSITY

Trimestriel de la Société Belge de Malacologie
association sans but lucratif
Quarterly of the Belgian Malacological Society

VOL. 11 (1) 2010 20 MARS

SOMMAIRE

Articles originaux – Original articles

G. T. Watters & G. Duffy New species of Annulariidae (Gastropoda) from the Bahamas and Dominican Republic 1

P. Ryall & C. Vos Two new species of *Turritella* (Gastropoda: Turritellidae) from western Africa 13

R. Houart A remarkable new species of *Zacatrophon* Hertlein & Strong, 1951 (Gastropoda: Muricidae: Ocenebrinae) from the Gulf of California 21

R. Houart Description of a new species from Indonesia in the *Murex scolopax* group (Mollusca: Gastropoda: Muricidae) and comments about *Murex (Murex) ternispina* Lamarck, 1822 from East Java 29

Vie de la Société – Life of the Society

C. Vilvens Prochaines activités 1

C. Delongueville & R. Scaillet Echantillonnage de mollusques invasifs et première signalisation de *Chama aspersa* Reeve, 1846 à Chypre Nord 3

(suite du sommaire en dernière page de couverture)

ISSN 1375-7474

Périodique trimestriel
Bureau de dépôt
1370 Jodoigne

RÉGION WALLONNE

Publié avec l'aide du Ministère de la Région Wallonne

SHOUT
SHARE
IT

COTISATIONS / MEMBERSHIP 2009

Membres résidant en Belgique
(NOVAPEX et les numéros hors série)
Membre effectif .... **40 €**

(sans le service du bulletin)
Personne appartenant à la famille d'un membre effectif et ayant même résidence .... 15 €

Versement à effectuer à la Banque de la Poste, au n° 000-0974225-54 de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret.

Abonnés résidant à l'étranger
(NOVAPEX et les numéros hors série)
Cotisation .... **55 €**

Versement à effectuer auprès de la Banque de la Poste Belge, Bruxelles, au n° 000-0974225-54 [IBAN : BE42000097422554 - BIC : (= SWIFT) BPOTBEB1] de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret **ou** en versant **58 euros par Paypal** (contacter roland.houart@skynet.be auparavant) **ou** par mandat poste international, **EN EURO UNIQUEMENT**, au nom de M. Marc Alexandre, rue de la Libération, 45, B-6182 Souvret
(tous frais y afférents à payer lors de l'acquittement)

FOREIGN SUBSCRIBERS
(NOVAPEX and irregularly published supplements)
Single subscription .... **55 €**

Payable at Banque de la Poste Belge, Brussels, account nr 000-0974225-54, [IBAN: BE42000097422554, BIC: (= SWIFT) BPOTBEB1] of M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret, Belgium, **or** by International Money Order at same address **or 58 euros** with **Paypal** (contact roland.houart@skynet.be before). Payable **IN EURO ONLY**. (All bankcharges to be paid by customer)

Suivant un accord avec la **SIM** (Societa Italiana di Malacologia), nos membres **européens** qui souscrivent également à cette société pour 2009, peuvent payer leur(s) cotisation(s) **à la SBM** pour les deux sociétés. Les membres européens de la **SIM** peuvent faire de même chez eux.
*By common agreement with **SIM**, our **European** members who subscribe to that society for 2009 can pay **to the SBM** the membership fees for both societies. The European members of the **SIM** can do the same paying to their society.*

Dans ce cas, vous obtiendrez une réduction de 2 € pour la SIM et de 2 € pour la SBM, soit :
In this way you can have a discount of 2 € for the SIM and of 2 € for the SBM :
SIM (Bol. Malacologico + Notiziario SIM) .... € 38,00
SBM (Novapex + Novapex/Société) .... € 53,00
(Belgian members: € 38,00)

Editeur responsable: R. Houart, St. Jobsstraat, 8, B-3400 Landen (Ezemaal)

PRESIDENT HONORAIRE (*Honorary President*) • M. R. DUCHAMPS, av. Mozart, 52, 1190 Bruxelles

CONSEIL D'ADMINISTRATION

PRESIDENT • M. R. HOUART, St. Jobsstraat, 8, 3400 Landen (Ezemaal) 016.78.86.16
VICE- PRESIDENT • M. C. VILVENS, rue de Hermalle, 113, 4680 Oupeye 04.248.32.25
TRESORIER (*Treasurer*) • M. M. ALEXANDRE, rue de la Libération, 45, 6182 Souvret 071.46.12.88
SECRETAIRE (*Secretary*) • Mme A. LANGLEIT, av. Cicéron, 27, bte 92, 1140 Bruxelles 02.726.17.61
BIBLIOTHECAIRE (*Librarian*) • M. E. MEULEMAN, Sart 32, 4171 Poulseur 04.380 55 16
ADMINISTRATEUR (*Manager*) • M. E. WAIENGNIER, rue Camille Wollès, 42, 1030 Bruxelles 02.705.81.80

Internet : http://users.swing.be/sw216502/
e-mail : roland.houart@skynet.be **ou** vilvens.claude@skynet.be ou sbm@advalvas.be

Les articles et textes présentés dans cette revue réflètent l'opinion personnelle de leur(s) auteur(s) et non pas nécessairement celle de la Société ou de l'éditeur responsable.
Tous droits de reproduction, de traduction et d'adaptation des articles publiés dans ce bulletin, réservés pour tous pays.
All rights of reproduction are reserved with the written permission of the board.

PUBLICATIONS PRECEDENTES/ FORMER PUBLICATIONS:
- Bulletin Mensuel d'Information (1966-1971)
- INFORMATIONS de la Société Belge de Malacologie (1972-1985)
- ARION (1986-1999)
- APEX (1986-1999)

SOCIETE BELGE DE MALACOLOGIE

NOVAPEX 11(1): 1-12, 20 mars 2010

New species of Annulariidae (Gastropoda) from the Bahamas and Dominican Republic

G. Thomas WATTERS
1315 Kinnear Road, Ohio State University, Columbus, Ohio 43212 USA
Watters.1@osu.edu

Glenn DUFFY
5679 Old Ranch Road, Sarasota, Florida 34241 USA

KEYWORDS. Gastropoda, Annulariidae, Bahamas, Dominican Republic.

ABSTRACT. Ten new taxa of Annulariidae are described from the Bahamas and the Dominican Republic: *Abbottella* (*Abbottella*) *harpeza* n. sp.; *A.* (*A.*) *mellosa* n. sp.; *A.* (*A.*) *milleacantha* n. sp.; *Chondropoma* (*Chondropoma*) *marmoreum* n. sp.; *C.* (*Wetmorepoma*) *oculeum* n. sp.; *Chondropomium hooksi* n. sp.; *C. alyshae* n. sp.; *C. pumilum* n. sp.; *Chondropomella elegans* n. sp. from the Dominican Republic; and *Opisthosiphon* (*Opisthosiphona*) *simpsoni williamsae* n. subsp. from the Bahamas. *Chondropomella* is removed from the Chondropominae to the Tudorinae.

INTRODUCTION

The family Annulariidae is one of the largest land snail families in the world despite its relatively narrow distribution in the Caribbean region. Many species have very narrow ranges. Hispaniola, and to a lesser extent the Bahamas, are areas of particularly high diversity of these snails. The annulariids of these islands were covered in detail by Bartsch (1946) and it seemed that there was little left to be done. Nevertheless, recent collections there reveal no apparent end to the diversity of these snails – ten new taxa are described here, most from a fairly narrow region of the Barahona Peninsula, an area known to harbor numerous endemics and peculiar taxa.

Repositories

BMNH: The Natural History Museum, London, UK.
GTW: Collection of G. Thomas Watters, Columbus, Ohio, USA.
OSUM: The Ohio State University Museum of Biological Diversity, Columbus, Ohio, USA.
UF: Florida Museum of Natural History, Gainesville, Florida, USA.

SYSTEMATICS

Superfamily **LITTORINOIDEA**
Family **ANNULARIIDAE** Henderson & Bartsch, 1920
Subfamily **ANNULARIINAE** Henderson & Bartsch, 1920
Genus ***Abbottella*** Henderson & Bartsch, 1920
Type species *Chondropomum moreletianum* Crosse, 1873 (by original designation) – Recent, Hispaniola, Cuba.

Abbottella (*Abbottella*) *harpeza* n. sp.

Figs 1-3

Type material. Holotype UF 420731 (5.6 mm maximum length, including peristome x 7.1 mm maximum width, including peristome).

Type locality. Dominican Republic, Isla Beata.

Distribution. Known only from the type locality.

Material Examined. UF 420731, Dominican Republic, Isla Beata, under leaf mold (holotype), May, 1993, G. Duffy!

Description. Shell small (holotype 5.6 mm maximum length, including peristome x 7.1 mm maximum width, including peristome), helicoid, umbilicus wide (holotype 26% of maximum width), circular, and open to apex. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, prominent. Teleoconch of 2 ¾ whorls, adnate except for immediately behind the peristome. Suture deeply impressed. Peristome double (holotype 2.1 mm diameter maximum inner aperture height x 2.0 mm diameter maximum inner aperture width; holotype 3.6 mm diameter maximum outer peristome height x 3.5 mm diameter maximum outer peristome width, but broken). Outer lip fairly thick, widely expanded, fluted, perpendicular to the whorl except posteriorly where it forms a wide concave auricle adherent to the previous whorl, ventrally covered with numerous erect, concentric lamellae. Inner lip exserted, very short. Spiral sculpture of low, squarish threads (~26 on the final whorl), every fifth one or so stronger than intervening threads, becoming stronger and more widely separated towards the umbilicus. Axial sculpture of closely spaced, fine lamellae between which are numerous microscopic lamellae. Intersections of spiral and axial sculptures produced into sharp, erect denticles, except in the umbilicus. Suture bounded by numerous denticles. Background color tan with darker spiral bands on top of whorls, breaking up into linear spots on the base and umbilicus. Both sides of outer lip with bold, radiating brown bands. Operculum multispiral with obliquely projecting lamella.

Discussion. *Abbottella harpeza* most closely resembles *A. crossei* (Pilsbry, 1933). Pilsbry gave only "Santo Domingo" as the type locality for *A. crossei*, referring to the island rather than the city. Bartsch (1946) identified Pilsbry's species with specimens from Samaná Bay in the northeastern Dominican Republic. *Abbottella harpeza* is more darkly colored than *A. crossei* and the thorny sculpture is more pronounced; the denticles are more aligned with the spiral sculpture than the axial sculpture in *A. harpeza*, the opposite is true of *A. crossei*. Species of *Abbottella*, including *A. crossei*, occur along the northern coast of Hispaniola and easternmost Cuba, although a few species have not been localized since their descriptions. This species from Isla Beata and *A. milleacantha* n. sp. from Isla Saona are the only species known from the southern coast of Hispaniola. Although known from a single specimen, this species is sufficiently distinct and geographically isolated to warrant description.

Etymology. Greek *harpeza*, a thorny hedge, in reference to the prickly sculpture of the shell.

Abbottella (*Abbottella*) *mellosa* n. sp.

Figs 4-6

Type material. Holotype UF 420729 (6.9 mm maximum length, including peristome x 7.9 mm maximum width, including peristome). Paratype OSUM 32477, from type locality (5.6 mm maximum length, including peristome x 6.6 mm maximum width, including peristome).

Type locality. Dominican Republic, Los Brazos, near Sosúa.

Distribution. Known only from the type locality.

Material Examined. Dominican Republic, Los Brazos, near Sosúa, on limestone after rain, April, 2004, A. Bodart & M. Coltro! (holotype, paratype, GTW 14055a [4 dd])

Description. Shell small (holotype 6.9 mm maximum length, including peristome x 7.9 mm maximum width, including peristome), helicoid, umbilicus wide (holotype 26% of maximum width), elliptical, and open to apex. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, prominent. Teleoconch of 3 ½ whorls, adnate except for immediately behind the peristome. Suture impressed. Peristome double (holotype 2.6 mm diameter maximum inner aperture height x 2.7 mm diameter maximum inner aperture width; holotype 3.9 mm diameter maximum outer peristome height x 3.7 mm diameter maximum outer peristome width). Outer lip fairly thick, fluted, perpendicular to the whorl at its base, concave at the apex, widely expanded, barely adnate to the previous whorl. Inner lip exserted, very short. Spiral sculpture of feeble threads (~30 on the final whorl), widely separated, becoming stronger towards the umbilicus. Axial sculpture of numerous feeble threads between which are microscopic lamellae. Spiral and axial sculptures intersect forming square pits, the junctures produced into very weak nodules. At the suture the axial sculpture forms minute cusps. On the holotype every fifth axial or so forms a peculiar enlarged scale at the suture; this is variable on other specimens examined. Shell honey-colored, waxy in appearance, with pale tan spots arranged in a barely discernable spiral pattern. Both sides of outer lip with radiating brown bands. Operculum multispiral with obliquely projecting lamella.

Discussion. *Abbottella mellosa* is characterized by its subdued sculpture and waxy appearance; it is probably the least sculptured of all the *Abbottella*. Only *A. adolfi* (Pfeiffer, 1852) approaches it in this regard. *Abbottella adolfi* has not been localized although Bartsch (1946) described the subspecies *peninsularis* from the Samaná Peninsula. *Abbottella mellosa* differs in having even finer, almost obsolete sculpture, the peculiar sutural tufts, and a lighter color.

Etymology. Latin *mellosa*, honey-colored, in reference to the color of the shell.

Abbottella (*Abbottella*) *milleacantha* n. sp.

Figs 7-9

Type material. Holotype UF 420728 (5.7 mm maximum length, including peristome x 7.5 mm width, including peristome). Paratype OSUM 32478, from type locality (5.5 mm maximum length, including peristome x 7.8 mm width, including peristome).

Type locality. Dominican Republic, northeast Isla Saona.

Distribution. Known only from the type locality.

Material examined. Dominican Republic, northeast Isla Saona, on limestone rocks, May, 1997, G. Duffy! (holotype & paratype).

Description. Shell small (holotype 5.7 mm maximum length, including peristome x 7.5 mm width, including peristome), helicoid, umbilicus wide (holotype 27% of maximum width), circular, and open to apex. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, prominent. Teleoconch of 2 ¾ whorls, adnate except for immediately behind the peristome. Suture impressed. Peristome double (holotype 2.8 mm diameter maximum inner aperture height x 2.5 mm diameter maximum inner aperture width; holotype 3.9 mm diameter maximum outer peristome height x 3.3 mm diameter maximum outer peristome width). Outer lip thin, fluted, perpendicular to the whorl, narrow except where the posterior edge is produced into a triangular auricle adherent with the previous whorl. Inner lip exserted, very short. Spiral sculpture of numerous (~30 on the final whorl) low threads, becoming stronger and more widely separated towards the umbilicus. Axial sculpture of closely spaced, minute, thin, low lamellae between which are numerous microscopic lamellae. Intersections of spiral and axial sculptures form erect prickles, strongest on periphery. Shell straw-colored with occasional obscure, pale tan spots. Early whorls may have a brown peripheral band. Operculum multispiral with obliquely projecting lamella.

Discussion. The uniformly minute, prickly sculpture and pale coloration is characteristic of this species. It is most closely related to the *Abbottella moreletiana* (Crosse, 1873) group of subspecies centered around Samaná Bay, particularly *A. m. gabriella* Bartsch, 1946. It differs in having even finer sculpture, a smaller umbilicus, and in its geographic isolation. It is the only *Abbottella* known from Isla Saona and only the second species known from southern Hispaniola.

Etymology. Latin *mille*, thousand + Greek *akantha*, thorn, prickle, in reference to the sculpture of the shell.

Subfamily **CHONDROPOMATINAE** Henderson & Bartsch, 1920
Genus ***Opisthosiphon*** Dall, 1905
Subgenus ***Opisthosiphona*** Henderson & Bartsch, 1920
Type species *Cyclostoma moreletianum* Petit de la Saussaye, 1850 (by original designation) – Recent, Cuba and Bahamas

Opisthosiphon (*Opisthosiphona*) *simpsoni williamsae* n. subsp.

Figs 10-12

Type material. Holotype UF 420736 (10.5 mm maximum length, including peristome, decollate x 5.5 mm maximum width, including peristome). Paratype OSUM 32480, Andros Island, 1.3 km E of Andros airport (11.6 mm maximum length, including peristome, decollate x 6.2 mm maximum width, including peristome). Paratype OSUM 32481, Andros Island, Red Bay settlement, 19.2 km W of Nicolls Town (9.7 mm maximum length, including peristome, decollate x 5.2 mm maximum width, including peristome). Paratype OSUM 32479, Berry Islands, Chub Cay, east end of airport runway, under rubble (11.5 mm maximum length, including peristome, decollate x 6.0 mm maximum width, including peristome).

Type locality. Bahamas, Andros Island, Twin Lakes Farm along Fresh Creek.

Material Examined. Bahamas. OSUM 6214. Andros Island, 1.3 km E of Andros airport. 24 June, 1974. C.B. Stein et al.! 16 dd (paratype lot) – OSUM 6344, 6355. Andros Island, Twin Lakes Farm along Fresh Creek. 24, 27 June, 1974. C.B. Stein et al.! 117 dd (holotype lot) – OSUM 6360. Andros Island, Red Bay settlement, 19.2 km W of Nicolls Town. 28 June, 1974. C.B. Stein et al.! 28 dd (paratype lot) – OSUM 6327. Andros Island, around blue hole, 23 km S of Stafford Creek settlement. 23 June, 1974. C.B. Stein et al.! 38 dd. – OSUM 6369. Andros Island, under rocks, ~67 m from shore, W of Red Bay settlement. 28 June, 1974. C.B. Stein et al.! 1 dd. – OSUM 6459. Andros Island, pine forest along road ~6 km NW of Staniard Creek settlement. 26 June, 1974. C.B. Stein et al.! 55 dd. – OSUM 6133. Andros Island, at airport. 20 June, 1974. C.B. Stein et al.! 1 dd. – GTW 13700a. Berry Islands, Chub Cay, east end of airport runway, under rubble. 18 May, 2007. G.T. Watters! 6 dd (paratype lot).

Distribution. Known from the northern half of Andros Island and Chub Cay, Berry Islands.

Description. Shell small (holotype 10.5 mm maximum length, including peristome, decollate x 5.5 mm maximum width, including peristome), pupoid, decollate as adult, umbilicus narrow but open. Nuclear whorls 1 ¼, scarcely demarcated from the teleoconch, smooth, tan with brown periphery, usually lost when adult. Non-decollate teleoconch of 4 whorls, adnate except for immediately behind the peristome. Suture channeled. Peristome double (holotype 2.7 mm diameter maximum inner aperture height x 2.3 mm diameter maximum inner aperture width; holotype 4.1 mm diameter maximum outer peristome height x 3.6 mm diameter maximum outer peristome width). Outer lip thin, perpendicular to the whorl, narrow to moderately expanded (wider over the umbilicus), composed of numerous layers. Inner lip exserted, very short. Siphon short, recurved dorsally and towards the previous whorl, its opening facing inward. Spiral sculpture absent except for weak ribs within the umbilicus. Axial sculpture of numerous, closely spaced, low lamellae. At the suture every other lamella is expanded into a prominent denticle that partially obscures the suture. Background color orange-red to gray or pale brown with 7-10 narrow spiral rows of smudged brown spots, the spots visible through the shell in the aperture. Operculum "rhytidopomine" - with a paucispiral chondroid base supporting a smaller calcareous plate composed of short erect lamellae curving from the distal to proximal border of the opercular whorl, without a sulcus.

The density of the axial lamellae and the width of the outer lip varies among specimens, as does the strength of the cusps. The color pattern is nearly always well-developed and varies from broken spiral bands and spots to (rarely) solid bands. In some specimens the earlier whorls are dark brown or purplish.

Discussion. Bartsch (1946) named four subspecies of *O. simpsoni*: *simpsoni s.s.* from Riding Point, Grand Bahama Island; *bryanti* from Lubbers Quarters off eastern Great Abaco Island; *abacoensis* from Matthew Point, Great Abaco Island; and *saccharinus* from Sugar Loaf Cay off northern Great Abaco Island. These taxa were based on combinations of axial rib numbers, intensity of color patterns, and width of outer lip. However, additional examples from elsewhere on Great Abaco Island complicate Bartsch's simple scheme. Specimens vary in sculptural strength, lip width, and color intensity without any discernable zoogeographic pattern.

This is also apparent in the Andros Island subspecies described here where local populations have various combinations of Bartsch's shell characters. For instance, the airport populations have wider lips than do others, the Twin Lake population has the most pronounced cusps, the blue hole population has the most widely spaced axial ribs, etc. While each of these could be considered a separate subspecies by Bartsch's criteria, we believe these to be nothing more than local variants exhibiting no greater overall geographic pattern.

Although features such as the width of the lip and axial rib spacing vary, overall *Opisthosiphon simpsoni williamsae* differs from *Opisthosiphon simpsoni s.s.* in having consistently more pronounced cusps and in having a clearly defined color pattern in all populations. *Opisthosiphon simpsoni williamsae* is the first *Opisthosiphon* recorded from the Berry Islands, which are located just off of northern Andros Island where this subspecies is also found. It is unusual that Bartsch did not have any specimens of this subspecies, particularly as he had specimens of *Opisthosiphon androsensis* Pilsbry, 1930, from Stafford Lake within the range of this subspecies.

Etymology. Named for Margaret "Peggy" Williams of Tallevast, Florida, USA, in recognition of her years of assisting both professional and amateur malacologists alike.

Genus ***Chondropoma*** Pfeiffer, 1847

Type species *Cyclostoma sagra* d'Orbigny, 1842 (by subsequent designation of Petit de la Saussaye, 1850) – Recent, Puerto Rico, Cuba, Hispaniola, Bahamas, Virgin Islands, Turks and Caicos, Cayman Islands, Swan Island, Guadeloupe.

Subgenus ***Wetmorepoma*** Bartsch, 1946

Type species *Chondropoma wetmorei* Bartsch, 1932 (by original designation) – Recent, Hispaniola.

Chondropoma* (*Wetmorepoma*) *oculeum n. sp.

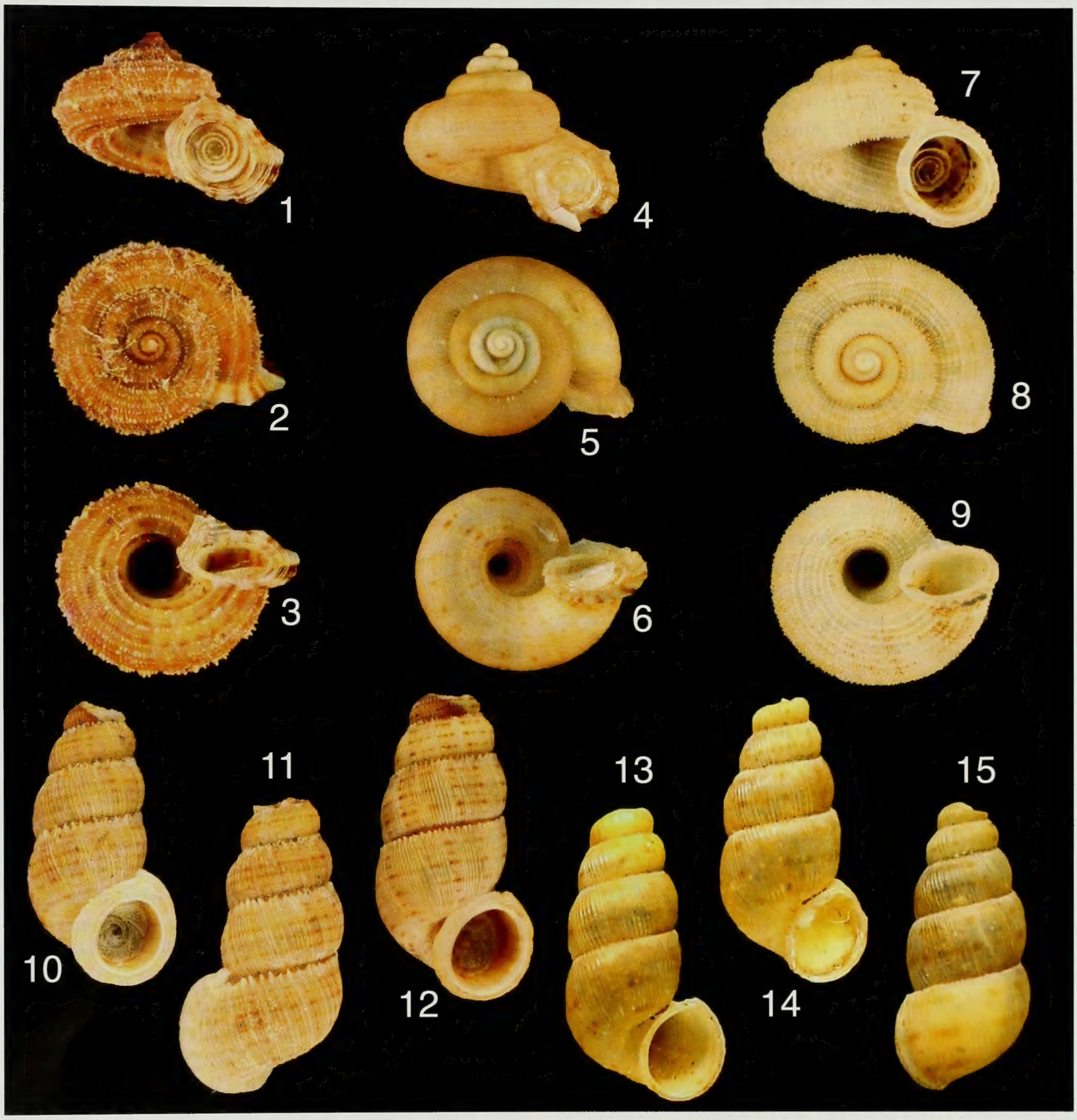
Figs 13-15

Type material. Holotype UF 420737 (9.0 mm maximum length, including peristome, decollate x 4.6 mm maximum width, including peristome). Paratype OSUM 32488, Barahona Peninsula, Pedernales Province, 16 km from intersection of main highway and road from Cabo Rojo, dry area, under rocks (9.2 mm maximum length, including peristome, decollate x 4.8 mm maximum width, including peristome). Paratype BMNH 1996348, Barahona Peninsula, Pedernales Province, SW part of Sierra de Baoruco, 23 km N of Cabo Rojo (9.0 mm maximum length, including peristome, decollate x 4.7 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Peninsula, Pedernales Province, 14.5 km N of Cabo Rojo, 500 m, under rocks in red dirt.

Figures 1-15

1-3. *Abbottella harpeza* n. sp., Holotype UF 420731, Dominican Republic, Isla Beata, 5.6 mm length;
4-6. *A. mellosa* n. sp., Holotype UF 420729, Dominican Republic, Los Brazos, near Sosúa, 6.9 mm length;
7-9. *A. milleacantha* n. sp., Holotype UF 420728, Dominican Republic, NE Isla Saona, 5.7 mm length;
10-12. *Opisthosiphon simpsoni williamsae* n. subsp. **10-11.** Holotype UF 420736, Bahamas, Andros Island, Twin Lakes Farm along Fresh Creek, 10.5 mm length; **12.** Paratype OSUM 32479, Berry Islands, Chub Cay, E end of airport runway, 11.3 mm length.
13-15. *Chondropoma oculeum* n. sp. **13.** Paratype OSUM 32488, Barahona Peninsula, Pedernales Province, 16 km from intersection of main highway and road from Cabo Rojo, 9.2 mm length; **14-15.** Holotype UF 420737, Dominican Republic, Barahona Peninsula, Pedernales Province, 14.5 km N of Cabo Rojo, 9.0 mm length.


1
4
7
2
5
8
3
6
9
11
13
15
10
12
14

Distribution. Dominican Republic, southern Barahona Peninsula.

Material examined. Dominican Republic. Barahona Peninsula, Pedernales Province, 14.5 km N of Cabo Rojo, at 500 m, 28 Sept., 1996, G. Duffy! (holotype) - Barahona Peninsula, Pedernales Province, 16 km from intersection of main highway and road from Cabo Rojo, dry area, under rocks, 28 Sept., 1996, G. Duffy! (paratype) – Barahona Peninsula, Pedernales Province, SW part of Sierra de Baoruco, 23 km N of Cabo Rojo, ~300 m above sea level, 28 Sept., 1996, G.Duffy! (paratype).

Description. Shell small (holotype 9.0 mm maximum length, including peristome, decollate x 4.6 mm maximum width, including peristome), elongate, umbilicus narrow but open, decollate as adult, shining. Nuclear whorls unknown. Teleoconch of ~4 ¼ whorls, adnate except for immediately behind the peristome. Suture weakly channeled. Peristome double (holotype 2.7 mm diameter maximum inner aperture height x 1.9 mm diameter maximum inner aperture width; holotype 3.1 mm diameter maximum outer peristome height x 2.3 mm diameter maximum outer peristome width). Outer lip thin, not expanded except for a weak triangular auricle posteriorly, separate from the previous whorl. Inner lip very short, exserted. Spiral sculpture absent. Axial sculpture of low but distinct raised cords. Axial sculpture produced into minute cusps at suture. Background golden with tan, interrupted spiral bands often forming a series of spots. Operculum paucispiral chondroid plate with fine granular deposit.

Discussion. Bartsch (1946) considered this a monotypic genus endemic to Isla Beata. This new species expands the range to the southern tip of the Barahona Peninsula on the mainland adjacent to Isla Beata. This is *Chondropoma* (*Wetmorepoma*) sp. of Watters (2006: 29).

This species differs from *C.* (*W.*) *wetmorei* Bartsch, 1932, the only other known species of *Wetmorepoma*, in having axial threads over the entire shell (in *C. wetmorei* the spire is devoid of axial sculpture), accompanying sutural cusps (absent in *C. wetmorei*), complete lack of spiral threads in the umbilicus (present in *C. wetmorei*), and a more subdued color pattern.

Etymology. Latin *oculeus*, full of eyes, in reference to the pattern of spots on the shell.

Subgenus ***Chondropoma*** Pfeiffer, 1847

Type species *Cyclostoma sagra* d'Orbigny, 1842 (by subsequent designation of Petit de la Saussaye, 1850) – Recent, Puerto Rico, Cuba, Hispaniola, Bahamas, Virgin Islands, Turks and Caicos, Cayman Islands, Swan Island, Guadeloupe.

Chondropoma* (*Chondropoma*) *marmoreum n. sp.

Figs 16-19

Type material. Holotype UF 420735 (18.3 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome). Paratype OSUM 32483, Barahona Peninsula, Pedernales Province, 22.4 km W of Oviedo (15.4 mm maximum length, including peristome, decollate x 9.2 mm maximum width, including peristome). Paratype OSUM 32482, Barahona Peninsula, Pedernales Province, Cabo Falso, under rocks on limestone cliff (17.8 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome). Paratype BMNH 1996347, from type locality (18.3 mm maximum length, including peristome, decollate x 9.6 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Peninsula, Pedernales Province, along Route 44 ca. 10 km SE of Pedernales.

Distribution. Dominican Republic, southern Barahona Peninsula.

Material examined. Dominican Republic. Barahona Peninsula, Pedernales Province, 35 km W of Oviedo, ~ 61 m above sea level, 26 Sept., 1996. G. Duffy! (holotype) - Barahona Peninsula, Pedernales Province, 22.4 km W of Oviedo (paratype) - Barahona Peninsula, Pedernales Province, Cabo Falso, under rocks on limestone cliff (paratype).

Description. Shell medium sized (holotype 18.3 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome), conical, umbilicus narrow but open, decollate as adult, shining. Nuclear whorls unknown. Teleoconch of ~4 ¼ whorls, adnate except for immediately behind the peristome. Suture channeled. Peristome double (holotype 5.3 mm diameter maximum inner aperture height x 4.6 mm diameter maximum inner aperture width; holotype 6.9 mm diameter maximum outer peristome height x 5.8 mm diameter maximum outer peristome width). Outer lip thin, moderately expanded except narrowed at umbilicus, perpendicular to the whorl, produced into a triangular auricle separate from the previous whorl. Inner lip very short, largely adherent to outer lip. Spiral sculpture of numerous (~36 on final whorl) low threads, becoming stronger and more widely separated towards the umbilicus. Axial sculpture of similar threads. Intersections of spiral and axial sculptures form latticed pattern of weak beads. Axial threads scarcely produced into cusps at suture. Shell tan to grey with dark brown "D"-shaped spots arranged in spiral bands, often aligned into vague axial stripes. Outer lip white. Operculum paucispiral chondroid plate with fine granular deposit.

Discussion. In overall form and color pattern this species resembles *Chondropoma eyerdami* Bartsch, 1946, from the Tiburon Peninsula of Haiti and *Chondropoma brownianum* Weinland, 1880, from Isla Gonave, Haiti. Both species have stronger sculpture than *C. marmoreum*. In addition, *Chondropoma brownianum* lacks the double, reflected lip of *C. marmoreum*.

Etymology. Latin *marmoreus*, marbled, in reference to the color pattern.

Subfamily **TUDORINAE** Watters, 2006
Genus ***Chondropomium*** Henderson & Bartsch, 1920
Type species *Chondropoma weinlandi* Pfeiffer, 1862 (by original designation) – Recent, Hispaniola.

Chondropomium hooksi n. sp.

Figs 20-23

Type material. Holotype UF 420727 (19.2 mm maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome). Paratype OSUM 32486, Peravia Province, 21 km W of Bani, ~60-90 m above sea level (18.7 mm maximum length, including peristome, decollate x 10.5 mm maximum width, including peristome). Paratype BMNH 1996351, Peravia Province, 21 km W of Bani, ~60-90 m above sea level (19.1 mm maximum length, including peristome, decollate x 11.1 mm maximum width, including peristome).

Type locality. Dominican Republic, Peravia Province, Punta Salina, 21 km W of Bani, under rocks on hill.

Distribution. Dominican Republic, southern Peravia Province.

Material examined. Dominican Republic. Peravia Province, 21 km W of Bani, ~60-90 m above sea level, 23 Sept., 1996, G. Duffy! (paratypes) – Peravia Province, Punta Salina, 22 km W of Bani, under rocks on hill, 23 Sept., 1996, G. Duffy! (holotype).

Description. Shell medium sized (holotype 19.2 maximum length, including peristome, decollate x 10.9 mm maximum width, including peristome), inflated, umbilicus narrow but open, decollate as adult. Nuclear whorls unknown. Teleoconch of ~4 ¾ whorls, adnate except for immediately behind the peristome. Suture indented. Peristome double (holotype 2.1 mm diameter maximum inner aperture height x 2.0 mm diameter maximum inner aperture width; holotype 5.9 mm diameter maximum outer peristome height x 5.3 mm diameter maximum outer peristome width). Outer lip moderately expanded, narrowest over umbilicus, produced into a small triangular auricle posteriorly, separate from the previous whorl. Inner lip flush with outer lip near umbilicus, very short and exserted elsewhere. Spiral sculpture of numerous (~36 on final whorl) low threads. Axial sculpture of similar threads forming a microscopic latticed pattern. Intersections of sculpture scarcely enlarged into weak beads. Groups of 3-10 axial threads gathered at suture into fused tufts. Background pale tan with rows of brown spots, often smudged or in groups, arranged in spiral patterns. Spiral pattern continues onto ventral face of outer lip. Tufts may be white. Operculum paucispiral chondroid plate on which are calcareous lamella flattened and fused into a concave plate, lacking a sulcus.

Discussion. This species and the next, *C. alyshae*, are placed in *Chondropomium* with reservations. They are the only species known from the genus with spiral sculpture outside of the umbilicus, but in overall form they resemble other *Chondropomium*, such as *C. swifti* (Shuttleworth, 1854), *C. beatense* (Clench, 1932), and *C. ignotum* (Bartsch, 1946). It may be that *C. hooksi* and *C. alyshae* form a separate unnamed genus allied with *Chondropomium*.
Chondropomium hooksi differs from *C. alyshae* primarily in sculpture. In *C. hooksi* the sculpture is finely beaded, whereas in *C. alyshae* it is serrated. The axial sculpture forms individual cusps at the suture in *C. alyshae* but form fused tufts of 3-10 axials in *C. hooksi*. From *Chondropoma marmoratum*, n. sp., *C. hooksi* has much finer sculpture and a pseudolamellate operculum.

Etymology. Randy Hooks, friend of GD who helped collect many of the specimens in this paper.

Chondropomium alyshae n. sp.

Figs 24-26

Type material. Holotype UF 420733 (18.7 mm maximum length, including peristome, decollate x 10.6 mm maximum width, including peristome). Paratype OSUM 32487, from type locality (17.4 mm maximum length, including peristome, decollate x 10.0 mm maximum width, including peristome). Paratype BMNH 1996352, from type locality (20.1 mm maximum length, including peristome, decollate x 10.5 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Province, 12 km S off main highway to Puerto Alejandro.

Distribution. Known only from the type locality.

Material examined. Dominican Republic. Barahona Province, 12 km S off main highway to Puerto Alejandro, 25 September 1996, G. Duffy! (holotype & paratypes).

Description. Shell medium sized (holotype 18.7 mm maximum length, including peristome, decollate x 10.6 mm maximum width, including peristome), inflated, umbilicus narrow but open, decollate as adult. Nuclear whorls unknown. Teleoconch of 3 ¾ - 4 whorls, adnate except for immediately behind the peristome. Suture indented. Peristome double (holotype 5.8 mm diameter maximum inner aperture height x 4.7 mm diameter maximum inner aperture width; holotype 8.1 mm diameter maximum outer peristome height x 6.2 mm diameter maximum outer peristome width). Outer lip moderately expanded, scalloped, narrowest over umbilicus, produced into a broad, curved auricle posteriorly, separate from the previous whorl. Inner lip very short and exserted. Spiral sculpture of numerous (~30 in the final whorl) low, narrow, flat, widely-separated threads. Axial sculpture of very fine threads. Intersections of sculpture produced into miscroscopic scales forming a fine serrated surface. Axial threads elongated at suture into unfused blade-like cusps. Background grayish, axial threads and cusps white, with spiral rows of tan chevron-shaped spots. Operculum paucispiral chondroid plate on which are calcareous lamellae flattened and fused into a concave plate, lacking a sulcus.

Discussion. See under *Chondropomium hooksi*, n. sp.

Etymology. Alysha Duffy, daughter of GD.

Chondropomium pumilum n. sp.
Figs 27-30

Type material. Holotype UF 420734 (15.0 mm maximum length, including peristome, decollate x 10.3 mm maximum width, including peristome). Paratype OSUM 32484, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco (15.9 mm maximum length, including peristome, decollate x 10.7 mm maximum width, including peristome). Paratype BMNH 1996350, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco (16.3 mm maximum length, including peristome, decollate x 10.3 mm maximum width, including peristome).

Type locality. Dominican Republic, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, under rocks at ~500 m.

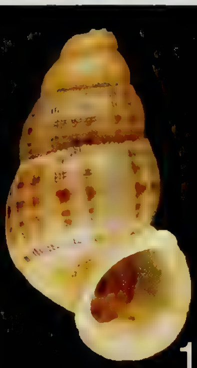
Distribution. Dominican Republic, Barahona Province, Pedernales Province, ~10-30 km N of Cabo Rojo, under rocks at ~500-900 m.

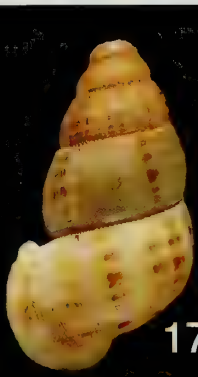
Material examined. Dominican Republic. Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco, 28 Sept., 1996, G. Duffy! (paratypes) – Barahona Province, 19-32 km N of Cabo Rojo, under rocks at ~500 m, 28 Sept., 1996, G. Duffy! (holotype).

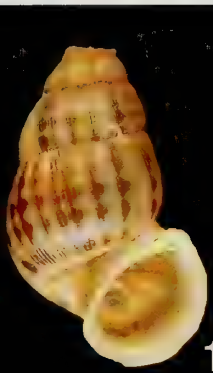
Description. Shell medium sized (holotype 15.0 mm maximum length, including peristome, decollate x 10.3 mm maximum width, including peristome), conical, umbilicus wide, open, decollate as adult. Nuclear whorls unknown. Teleoconch of 4 ¼ - 4 ½ whorls, adnate except for immediately behind the peristome. Suture channeled. Peristome double

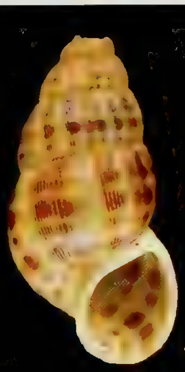
Figures 16-36

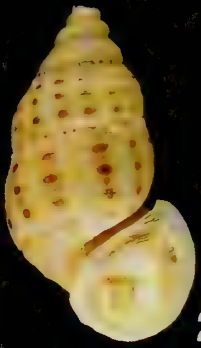
16-19. *Chondropoma marmoreum* n. sp. **16-17.** Holotype UF 420735, Dominican Republic, Barahona Peninsula, Pedernales Province, 35 km W of Oviedo, 18.3 mm length; **18.** Paratype OSUM 32483, Barahona Peninsula, Pedernales Province, 14 mi. W of Oviedo, 15.4 mm length; **19.** Paratype BMNH 1996347, from type locality, 18.3 mm length.
20-23. *C. hooksi* n. sp. **20-21.** Holotype UF 420727, Dominican Republic, Peravia Province, Punta Salina, 13 mi. W of Bani, 19.2 mm length; **22.** Paratype OSUM 32486, Peravia Province, 21 km W of Bani, 18.7 mm length; **23.** Paratype BMNH 1996351, Peravia Province, 21 km W of Bani, 19.1 mm length.
24-26. *C. alyshae* n. sp. **24-25.** Holotype UF 420733, Dominican Republic, Barahona Province, 12 km S off main highway to Puerto Alejandro, 18.7 mm length; **26.** Paratype OSUM 32487, from type locality, 17.4 mm length.
27-30. *C. pumilum* n. sp. **27.** Paratype OSUM 32484, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco, 15.9 mm length; **28-29.** Holotype UF 420734, Dominican Republic, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, under rocks at ~500 m, 15.0 mm length; **30.** Paratype BMNH 1996350, Barahona Province, Pedernales Province, 19-32 km N of Cabo Rojo, ~790-900 m above sea level in the Sierra de Bohoruco, 16.3 mm length.
31. *Chondropomella magnifica* (Pfeiffer, 1852). GTW 7639a, Dominican Republic, Barrera, 267 m, 26.5 mm length.
32-36. *C. elegans* n. sp. **32-33.** Holotype UF 420732, Dominican Republic, Independencia Province, ~ 8 km SW of Duvergé, Puerto Escondita, ~457 m above sea level, 27.2 mm length; **34-35.** Paratype OSUM 32485, from type locality, 30.3 mm length; **36.** Paratype BMNH 1996349, from type locality, 24.5 mm length.

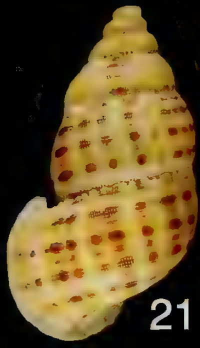

16

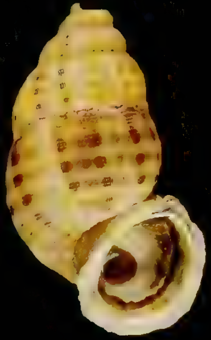

17

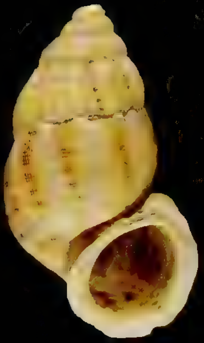

18

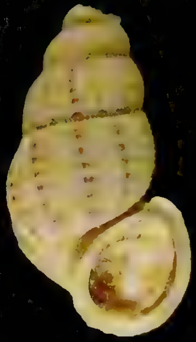

19

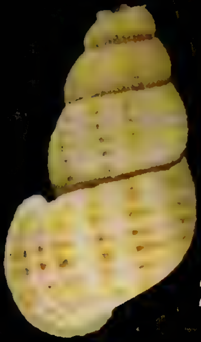

20

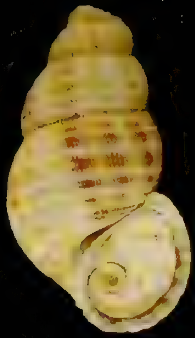

21

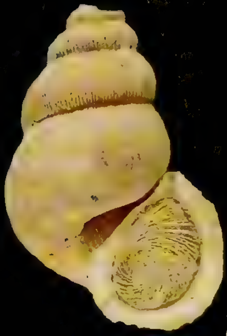

22

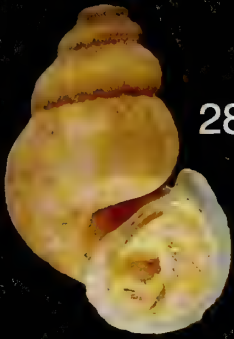

23

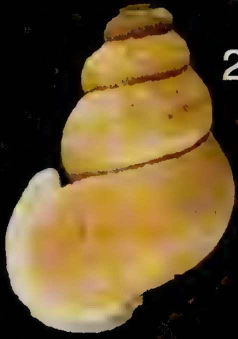

24

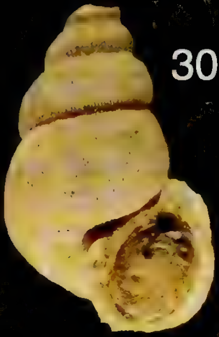

25

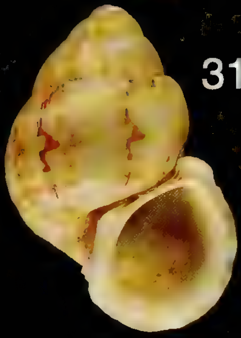

26

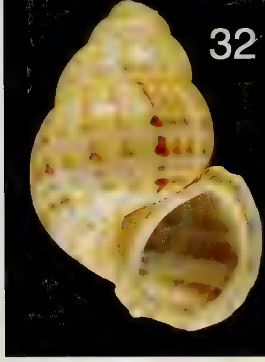

27

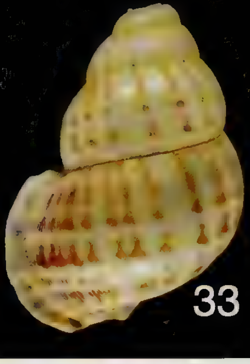

28

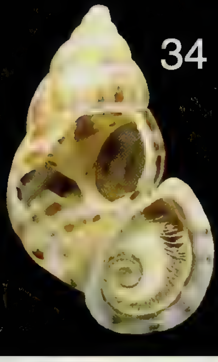

29

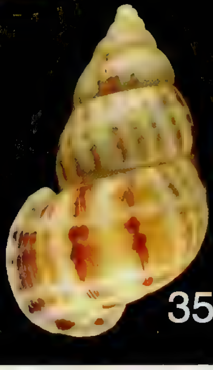

30

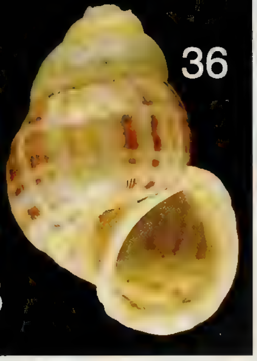

31


32


33


34


35


36

(holotype 5.4 mm diameter maximum inner aperture height x 4.7 mm diameter maximum inner aperture width; holotype 7.4 mm diameter maximum outer peristome height x 6.4 mm diameter maximum outer peristome width). Outer lip widely expanded, strongly scalloped on anterior margin, narrowest over umbilicus, produced into a prominent, concave auricle posteriorly, separate from the previous whorl. Inner lip very short and exserted. Spiral sculpture absent except for a few low, undulating cords in the umbilicus. Axial sculpture of numerous closely spaced, thin, low lamellae, occasionally anastomosing. Axial lamellae slightly elongated at suture into blade-like cusps. Background tan or brownish purple with vague narrow, spiral brown bands. Outer lip white. Operculum paucispiral chondroid plate on which are coarse calcareous lamellae fused into a concave plate, lacking a sulcus; operculum barely fitting in aperture.

Discussion. This species resembles a miniature *Chondropomium nobile* (Pfeiffer, 1852) in every respect. *Chondropomium nobile* exceeds 27 mm in length, but *C. pumilum* attains only ~15 mm. *Chondropomium nobile* inhabits the eastern edge of the Barahona Peninsula whereas *C. pumilum* inhabits the western edge.

Etymology. Latin *pumilum*, dwarfish, in reference to its relationship to *Chondropomium nobile*.

Genus : *Chondropomella* Bartsch, 1932
Type species : *Cyclostoma magnificum* "Sallé" Pfeiffer, 1852 (by original designation) – Hispaniola

Chondropomella elegans n. sp.

Figs 32-36

Type material. Holotype UF 420732 (27.2 mm maximum length, including peristome, decollate x 19.0 mm maximum width, including peristome). Paratype OSUM 32485, from type locality (30.3 mm maximum length, including peristome x 17.9 mm maximum width, including peristome). Paratype BMNH 1996349, from type locality (24.5 mm maximum length, including peristome, decollate x 17.4 mm maximum width, including peristome).

Type locality. Dominican Republic, Independencia Province, ~ 8 km SW of Duvergé, Puerto Escondita, ~457 m above sea level.

Distribution. Known only from the type locality.

Material examined. Dominican Republic, Independencia Province, ~ 8 km SW of Duvergé, Puerto Escondita, ~457 m above sea level, 26 Sept., 1996, G. Duffy! (holotype & paratypes).

Description. Shell large (holotype 27.2 mm maximum length, including peristome, decollate x 19.0 mm maximum width, including peristome), ovate, umbilicus narrow but open, may be decollate as adult, polished. Nuclear whorls 1 ½, smooth, but often lost. Teleoconch of 4 – 5 ½ whorls, adnate. Suture indented. Peristome double (holotype 10.4 mm diameter maximum inner aperture height x 7.9 mm diameter maximum inner aperture width; holotype 13.6 mm diameter maximum outer peristome height x 11.3 mm diameter maximum outer peristome width, but broken). Outer lip moderately expanded, undulating, narrowest over umbilicus, minimally adherent to the previous whorl, produced into a weak auricle posteriorly, separate from the previous whorl. Inner lip adherent to outer lip or barely exserted. Spiral sculpture limited to weak cords in the umbilicus. Axial sculpture of closely spaced, very low, undulating ribs. Background white with axial brown and tan markings broken up by spiral, colorless zones. Base spotted. Pattern extends to both sides of the outer lip. Operculum paucispiral chondroid plate on which are calcareous lamellae divided into two regions: outer half of the spiral with very coarse lamellae, inner half smoothly fused. The outer edges of the opercular spiral are raised, not flush with the previous whorls.

Discussion. Species of *Chondropomella* Bartsch, 1932, are among the largest of annulariids. They are rarely seen in collections. Bartsch included two species in his genus: *C. magnifica* Pfeiffer, 1852, and *C. platychila* Pfeiffer, 1848. Watters (2006) included a third species, *Incertipoma virile* Bartsch, 1946.

The distribution of the three species has been the subject of speculation. Pfeiffer recorded "*insula Haiti*" for the type locality of *C. magnifica*, collected by the French explorer August Sallé. Crosse (1890) stated that Sallé had found the species on rocks at the entrance to a cave at Barrera, which Bartsch (1946) further localized in Azua Province about 27 km southwest of Azua. The specimen illustrated here (Fig. 31) is from Barrera.

Pfeiffer originally (1847b) misidentified the worn specimen he would later name *C. platychilum* as *Cyclostoma latilabris* d'Orbigny, 1842, a Cuban species. In 1848 he renamed the specimen *C. platychilum* but was unaware of its origin. Bartsch (1946) identified a specimen at the U.S. National Museum (also worn) from Trujin as an example of Pfeiffer's *C. platychilum*. As for *Incertipoma virile* Bartsch gave only "Haiti" as the type locality.

No specimen before Bartsch of these three species had an operculum. But Pfeiffer (1852), in his original description of *C. magnificum*, observed "*Operc. Cartilagineum, planum, pallide corneum*" suggesting, as Bartsch noted, a chondropomine operculum. (The type has not been located and is presumed lost.) Because of this both Bartsch (1946) and Watters (2006) placed *Chondropomella* in the Chondropominae. However, these species also seem closely related to the tudorine *Chondropomium* in terms of size, sculpture, and geography. Watters (2006) noted that some populations of *Chondropomium superbum* (Henderson & Simpson, 1902) have pseudolamellate opercula whereas others do not. The fact that *C. elegans* has a pseudolamella places it near *Chondropomium*. But its obvious affinities with *C. magnificum* suggest that both should be included near *Chondropomella*. The relevant points are: the opercula of *C. platychilum* and *C. virilis* are unknown; the operculum of *C. magnificum* apparently lacks a pseudolamella (based on a single observation); and the operculum of *C. elegans* possesses a pseudolamella. Apparently *Chondropomella*, like *Chondropomium*, may or may not have a pseudolamella. Because of this *Chondropomella* is herein removed from the Chondropominae and placed in the Tudorinae near *Chondropomium*.

Chondropomella was based on species with a sinuous, widely expanded outer lip adherent to the previous whorl. The inclusion of *C. elegans* requires a reworking of that definition and the recognition of additional species for inclusion in *Chondropomella*. *Chondropomella* differs from the closely related *Chondropomium* in having a widely expanded outer lip that may or may not be adherent to the earlier whorl; *Chondropomium* species have virtually no expansion to this lip. Otherwise both genera have similar sculpture and attain a similar large size. The following two species are removed from *Chondropomium* to *Chondropomella*: *Chondropoma asymmetricum* Pilsbry, 1933, from Fond Parisien on the south shore of Étang Saumâtre in Haiti, originally described in *Chondropoma* (*Chondropomella*) by Pilsbry but removed from *Chondropomella* by Watters (2006), but herein reinstated; and *Chondropoma inaequilabrum* Bartsch, 1946, from Mount Petitchemin on the Tiburon Peninsula of Haiti. *Chondropomella* thus contains six species: *C. magnificum, C. platychilum, C. virile, C. elegans, C. asymmetricum*, and *C. inaequilabrum*. *Chondropomella* occupies the valley between Sierra de Bohoruco and Neiba Sierra, including the lake region, spanning the Haiti-Dominican Republic border.

Chondropomella elegans is very similar to *C. magnificum* but differs in sculpture. The axial sculpture of *C. elegans* consists of very low undulating ribs; in some places the surface is completely smooth. The suture is not modified by the axial ribs. In *C. magnificum* the axial sculpture is of minute, narrow, widely separated threads that form minute cusps at the suture. The color patterns of the two species are nearly identical. The two species are separated by ~100 km.

Etymology. Latin *elegans*, elegant, in reference to the impressive color pattern and size of the shell.

ACKNOWLEDGEMENTS

The authors thank Roland Houart and an anonymous reviewer for significantly improving this contribution, and Marcus Coltro of *Femorale* for the gift of specimens.

REFERENCES

Bartsch, P. 1932. A newly discovered West Indian mollusk faunula. *Proceedings of the U.S. National Museum* 81: 1-12, pls. 1-3.

Bartsch, P. 1946. The operculate land mollusks of the family Annulariidae of the island of Hispaniola and the Bahama Archipelago. *Bulletin of the U.S. National Museum* 192: iv+252pp, 38 pls.

Clench, W.J. 1932. Some land mollusks from Beata Island, Santo Domingo. *Proceedings of the New England Zoölogical Club* 12: 103-107.

Crosse, H. 1873. Diagnoses molluscorum novorum, ex insula Haïti dicta oriundorum. *Journal de Conchyliologie* 21: 352-356.

Crosse, H. 1874. Description de Mollusques terrestres nouveaux provenant de l'Isle d'Haïti. *Journal de Conchyliologie* 22: 82-89.

Dall, W.H. 1905. An arrangement of the American Cyclostomatidae, with a revision of the nomenclature. *Proceedings of the Malacological Society of London* 6: 208-210.

Henderson, J.B. & Bartsch, P. 1920. A classification of the American operculate land mollusks of the family Annulariidae. *Proceedings of the U.S. National Museum* 58: 49-82.

Henderson, J.B. & Simpson, C.T. 1902. A new Haitian *Chondropoma*. *Nautilus* 16: 88-89.

Orbigny, A.C.V.D. d'. 1842. Mollusques. In: *Historie physique, politique et naturelle de l'Ile de Cuba*. (Ramon de la Sagra). French edition. 1: 209-264, pts. 15-17.

Petit de la Saussaye. 1850. Notice sur le genre *Cyclostoma*, et catalogue des espèces appartenant à ce genre. *Journal de Conchyliologie* 1: 36-55.

Pfeiffer, L. 1847a. Uebersicht aller bekannten Arten von Cyclostomaceen. *Zeitschrift für Malakozoologie* 4: 101-112.

Pfeiffer, L. 1847b. Die gedeckelten Lungenschnecken. (Helicinacea et Cyclostomacea). In: *Systematisches Conchylien-Cabinet von Martini und Chemnitz*. Küster edition. Part 19. Installment 64: pp. 25-40, pls. 8, 10, 12-14, 17.

Pfeiffer, L. 1848. Die gedeckelten Lungenschnecken. (Helicinacea et Cyclostomacea). In: *Systematisches Conchylien-Cabinet von Martini und Chemnitz*. Küster edition. Part 19. Installment 74: pp. 57-96, pls. 20-25.

Pfeiffer, L. 1852. *Monographia pneumonoporum viventum*. T. Fischer: 435 pp.

Pfeiffer, L. 1854. Die gedeckelten Lungenschnecken. (Helicinacea et Cyclostomacea). *Systematisches Conchylien-Cabinet von Martini und Chemnitz* (Küster edition). Part 19. Installment 136: 309-356, pls. 43-48.

Pfeiffer, L. 1862. Bemerkungen zu den beschribenen Arten. *Malakozoologische Blätter* 9: 91-97.

Pilsbry, H.A. 1933. Santo Domingo land mollusks collected by Daniel C. Pease, 1932, and by A. A. Olsson, 1916. *Proceedings of the Academy of Natural Sciences of Philadelphia* 85: 121-162.

Shuttleworth, R.J. 1854. Beiträge zur näheren Kenntniss der Land- und Süsswasser-Mollusken der Insel Portorico. *Mittheilungen der naturforschenden Gessellschaft in Bern* (321-322): 89-103.

Watters, G.T. 2006. *The Caribbean land snail family Annulariidae: A revision of the higher taxa and a catalog of the species*. Backhuys Publishers: 557 pp.

Weinland, D.F. 1880. Zur Molluskenfauna von Haiti. *Jahrbücher der Deutschen Malakozooligischen Gesselschaft nebst Nachrichtsblatt* 7: 338-378.

NOVAPEX 11(1): 13-20, 20 mars 2010

Two new species of *Turritella* (Gastropoda: Turritellidae) from western Africa

Peter RYALL
St. Ulrich 16, A-9161 Maria Rain, Österreich
peterryall1@hotmail.com

Chris VOS
Merellaan 13, 3270 Scherpenheuvel, Belgium
chris.vos@compaqnet.be

KEYWORDS. Cerithoidea, Turritellinae, *Turritella nzimaorum* sp. nov., *Turritella wareni* sp. nov., western Africa, *Turritella cochlea* Reeve, 1849, Mauritania, Marche-Marchad.

ABSTRACT. *Turritella nzimaorum* sp. nov. and *Turritella wareni* sp. nov. are hereby described and illustrated. Their habitat ranges are respectively defined as from western Ghana to northern Angola and from Western Sahara to Gabon. The radula of *T. nzimaorum* sp. nov. is presented whilst the opercula of both new species are illustrated. They are compared to other, similar western African species.

INTRODUCTION

The family Turritellidae is a relatively small family with approximately 100 recent species world-wide. About half of the extant species are endemic to various parts of Australia (Beesley et al., 1998). Most of the remaining species inhabit regions off the coasts of central America (eastern and western) and western Africa. The latter region was revised by Marche-Marchad (1960) treating 16 species and two subspecies (divided over 5 genera), and another 9 species of which the presence in that area is yet to be confirmed.

Material collected by the MNHN, Paris as well as by the first author, and examined and compared to type material previously by A. Warén (SMNH, pers. com. 2nd author, 2008), shows that currently undescribed species occur in the western African region. The research also indicates a need for a complete taxonomical revision in order to clear out issues such as subsequent references to Marche-Marchad's (1960) reference to *Turritella cochlea* Reeve, 1849 which, after examination, is described here as *Turritella wareni* sp. nov.

Furthermore, species of Turritellidae are usually quite variable and as a result many synonyms have been described throughout history. At the same time, there are several examples of good species with very restricted distribution areas.

The classification of the family is presently chaotic [Garrard (1972), Marche-Marchad (1960), Bandel (2006), and many others applied different analytical methods based on one or more characteristics] with numerous genera and subgenera often based on subtle differences in fossil species, for which there seems to be little correlation to the soft parts of living species. It is evident that further study is required to clarify generic, as well as specific taxonomy of the Turritellidae family and, until further information is available, we uncritically use the generic name *Turritella* for all species.

Material and Methods.

The two new species are described from specimens originating from different sources:

- *Turritella nzimaorum* sp. nov. is described from specimens collected by the first author who has dived and dredged extensively off Ghana for marine molluscan fauna over the past 30 years. Comparison is being made with a similar specimen in the collection of Christfried Schönherr (Luanda, Angola) which was collected off the coast of Luanda, Angola.
- *Turritella wareni* sp. nov. is described from specimens separated by A. Warén (SMNH) from material conserved in the MNHN, Paris and by additional material from both authors' collections and the collection of F. Swinnen (Belgium); material which was trawled off Mauritania, Western Sahara and northern Senegal.

Abbreviations used

CCS: Collection Christfried Schönherr, Luanda, Angola.
CCV: Collection Chris Vos, Scherpenheuvel, Belgium.
CPR: Collection Peter Ryall, Maria Rain, Austria.
BMNH (and NMNH): Natural History Museum, London, UK.
MNHG: Muséum d'histoire Naturelle, Geneva, Switzerland.

MNHN: Muséum national d'Histoire naturelle, Paris, France
SMNH: Natural History Museum, Stockholm, Sweden
ZMB: Zoologisches Museum, Berlin, Germany

SYSTEMATICS

Family **Turrittellidae** Lovén, 1847
Subfamily **Turritellinae** Lovén, 1847
Genus ***Turritella*** Lamarck, 1799
Type species *Turbo terebra* Linnaeus, 1758

Turritella nzimaorum sp. nov.

Figs 1 – 7; 13 - 15

Type material. Holotype MNHN 22608, 58.3 mm x 18.5 mm (Ex. Coll. P. Ryall).
Paratypes: Paratype 1: MNHN 22609, 64.1 mm x 21.7 mm (Ex. Coll. P. Ryall); paratype 2: Coll. P. Ryall, 54.0 mm x 18.5 mm; paratype 3: Coll. C. Schönherr ca. 150 mm

Type locality. Off Takoradi, western Ghana, on a hard rock bottom covered with fine sand/silt and rocks.

Examined material.

- 1 shell, collected without animal, 58.3 mm x 18.5 mm, from off Takoradi, Western Ghana, ex. CPR, deposited at MNHN and designated here as holotype, coll. nr. MNHN 22608 (Figs 1, 2)
- 1 specimen, live collected, Ghana, off Adjua at ca 40 m, from canoe fishermens' net, January 1983, 64.1 mm x 21.7 mm, ex. CPR, deposited at MNHN and designated here as paratype 1; coll. nr. MNHN 22609 (not figured). Radula and operculum previously examined by A. Warén (SMNH). (Figs 13 - 15)
- 1 shell, collected without animal, CPR, white eroded shell. Collected by P. Ryall, by scuba at 20m, under rock in silt, Mudrachmi Bay, Ghana, January, 1986. 54.0 mm x 18.5 mm (ex-protoconch). Designated here as paratype 2 (Fig. 3)
- 1 shell, collected without animal, CCS, ca. 150 mm, diameter ca 50 mm, dredged at about 45 m deep, off Luanda, Angola. Designated here as paratype 3. (Fig. 4)
- 1 shell, collected without animal, CPR, adult specimen, heavy shell, apex missing, dredged at 25m on sand and rubble off Mudrachmi Bay, western Ghana, March, 1989. 66.7 mm x 23.9 mm
- 1 specimen, live collected, CPR, apex missing; Ghana, Abokwa Island, dredged on silt in 20 m, Dec. 1989, 48.9 mm x 16.6 mm
- 1 shell, collected without animal, CPR, dredged at 20m off the Volta estuary, Ghana, March, 1995, 25.4 mm x 9.7 mm (fragment: adapical whorls only, ex-protoconch, lower whorls missing)
- 3 shells, collected without animal, CPR, taken at a depth of 22 to 35 metres off Mudrachmi Bay, Ghana, 78.3 mm x 23.5 mm; 80.3 mm x 27.4 mm; 80.5 mm x 27.5 mm (Figs 5 – 7).
- 5 shells, examined visually using digital photography only, Eastern Ghana, off the Volta estuary, dredged 20 m depth, March 1995,

Distribution range. Currently known from western Ghana to northern Angola.

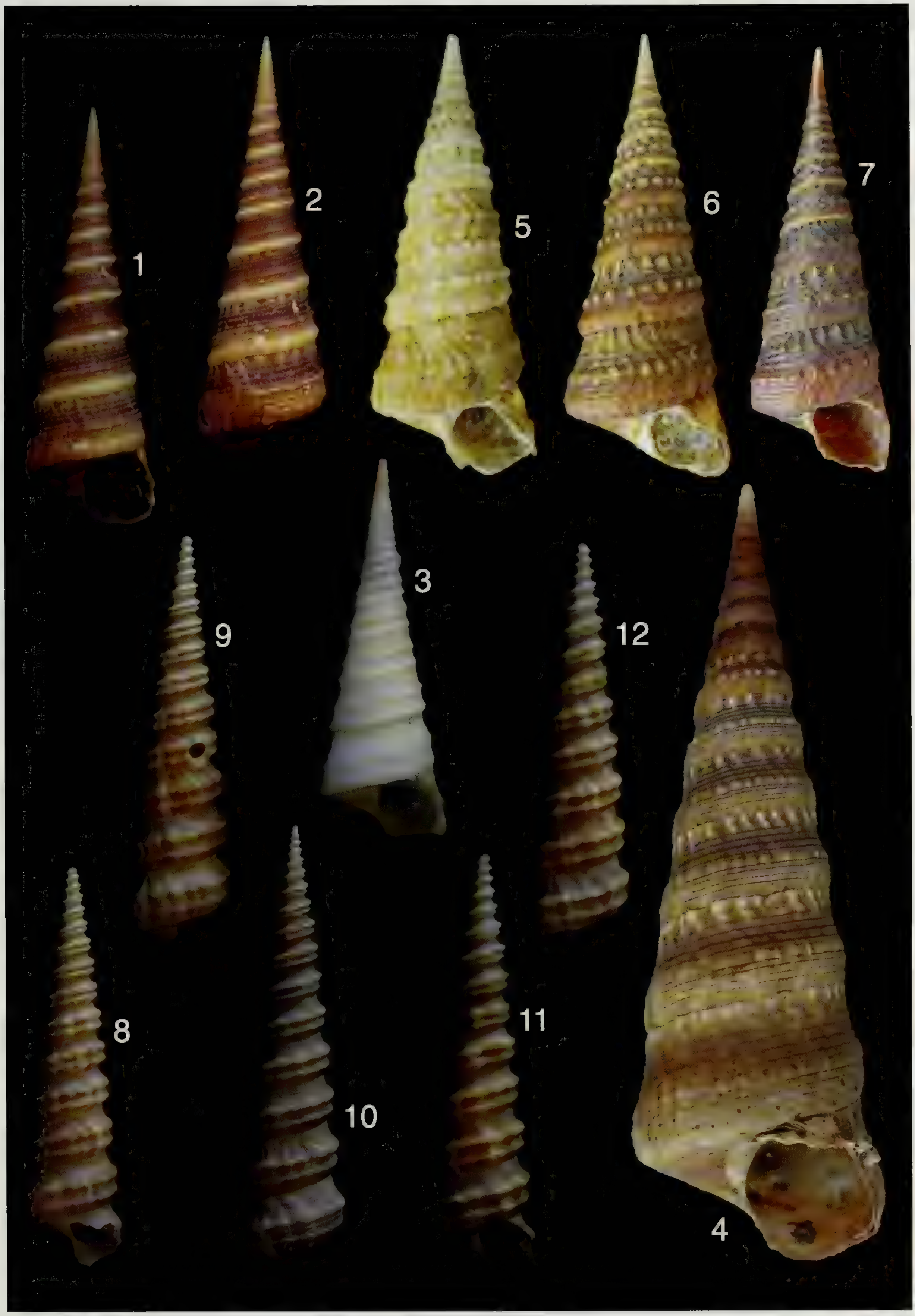
Habitat. In silt and sand bottom between rocks and rubble on hard substrata at depths of 15 to 50 meters.

Dimensions. Average size between 60 mm and 80 mm. Largest specimen examined (paratype 3, CCS) measures ca. 150 mm.

Description. Shell tall and broadly conical, with flat whorls. The examined specimens show that the more apical whorl is broader on the lower end than the apical diameter of the succeeding one.
Protoconch glassy, and measures approx. 0.5 – 0.7mm for one and a half whorls when the first keel appears The adapical whorls, up to a diameter of 8-9 mm, have a sharp median keel, and a rounded suprasutural ridge. The whole surface is covered by a very fine spiral striation. On the lower whorls, the sculpture becomes coarser and more irregular and a subsutural spiral cord is added.

Figures 1-12 (Figs 1-3; 8-12: Courtesy of Kenneth Vos)

1-7. *Turritella nzimaorum* sp. nov.
1-2. Holotype MNHN 22608, 58.3 mm x 18.5 mm, Off Takoradi, western Ghana; **3.** Paratype 2: coll. P. Ryall, 54.0 mm x 18.5 mm, Mudrachmi Bay, Ghana (eroded shell); **4.** Paratype 3, coll. C. Schönherr, Off Luanda, Angola, Ca 150 mm; **5-7.** Colour set, coll. P. Ryall, **5.** 78.3 mm x 23.5 mm; **6.** 80.3 mm x 27.4 mm; **7.** 80.5 mm x 27.5 mm
8-12 *Turritella wareni* sp. nov.
8-9. Holotype MNHN 22611, 55.8 mm x 13.7 mm, off Mauritania, 17°18'N, 16°32'W, plateau continental, N. O. N'Diago, st. 181, 104m deep; **10.** Paratype 1 MNHN 22612, 62.2 mm x 14.5 mm, off Mauritania, 18°36' N, 16°31'W, plateau continental, N. O. N'Diago, st. 118, 96m deep; **11-12.** Paratype 2 coll. C. Vos, ref. TU517, 53.8 mm x 13.2 mm, Cap Barbas, Western Sahara, Trawled by fishermen in 50-60m.


1
2
5
6
7
9
3
12
8
10
11
4

At a diameter of 10-12 mm the keels and cords become nodulous. Later on these become tubercular. At 10-15 mm diameter, 2 to 4 additional, weaker spirals appear in the concave interspaces. During this change the dominance of the two original spirals reduces. Large specimens have 2 spiral cords above the median series of knobs and 5 slightly smaller ones below. The axial sculpture consists of fine growth lines, slightly stronger than the spiral striation, with a broad embayment with its deepest part at and just above the median keel. The basal surface is flat and sharply demarcated in immature specimens, but becomes more rounded in larger, more mature specimens.

The typical colour is dark brown below the suture, becoming lighter at the base of each whorl and on the subsutural and median knobs. The protoconch is pale cream to mauve. White and pale brown specimens have been recorded suggesting some degree of colour variation (Figs 3, 5 - 7).

Remarks. Adult specimens are very heavy compared to all other species in this family.

Operculum. Dark brown, stiff, sturdily built, with more than 15 glossy whorls sculptured by weak growth lines only. The edge of the coils slightly overlap the subsequent coil. (Fig. 15).

Radula. taenioglossan, (Figs 13, 14). The middle row of ventral teeth and the two adjacent rows of lateral teeth are approximately of the same size and shape. Detail (Fig. 14) shows that the middle teeth have a serrated edge.

Etymology. Named after the indigenous Ghanaian tribe Nzima, who are predominantly fisher folk and inhabit the western region of Ghana where the species was first collected.

Comparison. *Turritella conspersa* Adams & Reeve, 1850 (p. 47) has a single keel on the first six whorls, but subsequent whorls bear two rounded ridges and the surface is covered with a uniform striation which is never nodulose. The operculum also differs by having a strong sculpture of obliquely radiating, incremental lines comprising of many clearly visible granules. *T. aquila* Reeve, 1849 was described from Japan and later considered a synonym of *T. conspersa* by Marche-Marchad (1960: 864). The locality range of *T. conspersa* Adams & Reeve, 1850 is north-west Africa to Guinea Bissau.

Turritella torulosa Kiener, 1844, which closely resembles *T. conspersa* Adams & Reeve, 1850, has apical whorls which are less strongly keeled; at a diameter of 10 mm the whorls have 3 spiral ribs; at 15 mm 4 ribs. Its operculum has long, radiating bristles forming a continuation of the incremental ridges. It is known from Morrocco to Guinea Conakry.

Turritella gemmata Reeve, 1849 (Holotype BMNH 1958.6.11.11), described without mention of locality, slightly resembles *T. nzimaorum* sp. nov. but its apical whorls are more convex and not as distinctly keeled; only 2-3 whorls have a single keel (*T. candida* Reeve, 1849, syntypes BMNH 1958.6.11.12-13, is a synonym). This species can be recognised by the sinuate basal part of the peristome. The operculum has a sculpture of micro tubercles forming the growth lines. *T. gemmata* Reeve, 1849 occurs from Mauritania to Angola, where it is common intertidal to a depth of 5m under rocks, often completely buried in sediment.

Turritella meta Reeve, 1849 was described without mention of locality, but has been associated with the west African fauna (Dautzenberg 1910: 75, Marche-Marchad 1960:867) and as a synonym of *T. gemmata* Reeve, 1849 (Gofas *et al.* 1985: 48, fig 16a). The holotype (BMNH 1904.10.28.124) however seems to be nearly identical to the western American *T. banksii* Reeve, 1849.

Reeve (1849, Pl. VII, fig. 34) mentions for *T. meta* that it is "Unacquainted to the *T. nebulosa* of M. Kiener" (Kiener, 1844, p. 33; pl. 14, fig. 2) but that he was tempted to assign this species to it, leaving reasonable doubt on the true identity of this species.

Among the fossil Turritellidae, *Turritella desmarestina* Basterot, 1825, from the Aquitanian deposits around Bordeaux is similar. It is the type species of the subgeneric name *Peyrotia* Cossmann, 1912.

T. desmarestina Basterot, 1825 is well known from the French and Italian Helvetian (Sacco 1895, pp 18-21) and Aquitanian (Cossmann & Peyrot, 1921) and seems to be perhaps the most voluminous *Turritella* known with a size of up to 160 x 60 mm.

Turritella wareni sp. nov.

Figs 8 – 12; 16, 17

Type material. Holotype: MNHN 22611, 55.80 mm x 13.76 mm.

Paratypes: Paratype 1: MNHN 22612, 62.2 mm x 14.5 mm; paratype 2: CCV ref. TU517, 53.8 mm x 13.2 mm; paratype 3: CPR, 66.4 mm; paratype 4: SMNH cat. Nbr. 6105, 46 mm.

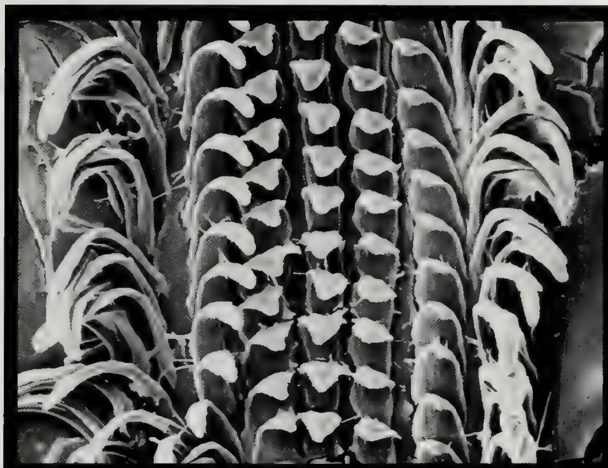
Type locality. Off Mauritania, N/O N'Diago, station 181, 17°18'N, 16°32'W, 104 m depth.

Figures 13-17 (courtesy of Anders Warén)

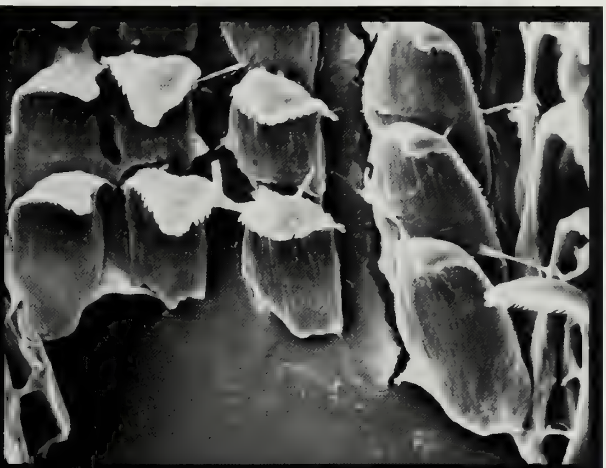
13-15. *Turritella nzimaorum* sp. nov.

13-14. Paratype 1 MNHN 22609, radula; **15.** Paratype 1 MNHN 22609, operculum.

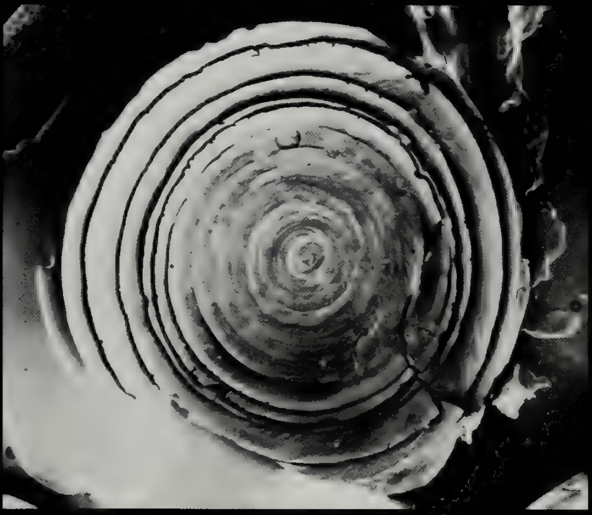
16 -17. *Turritella wareni* sp. nov. Holotype MNHN 22611, operculum



13

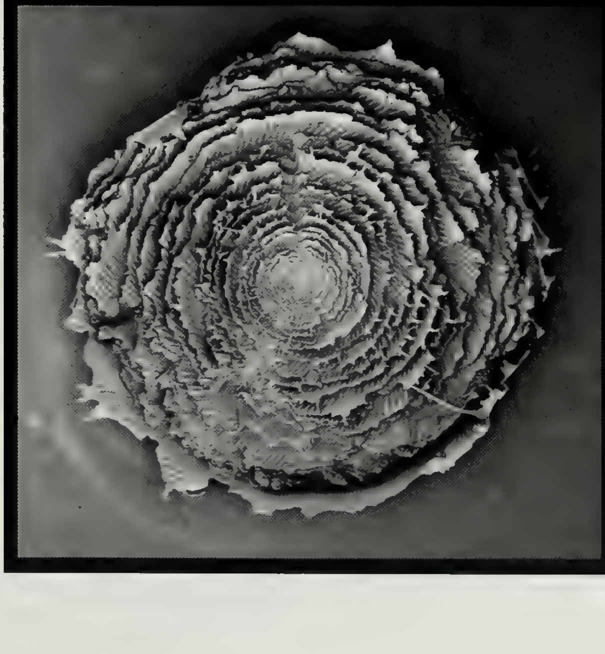


14

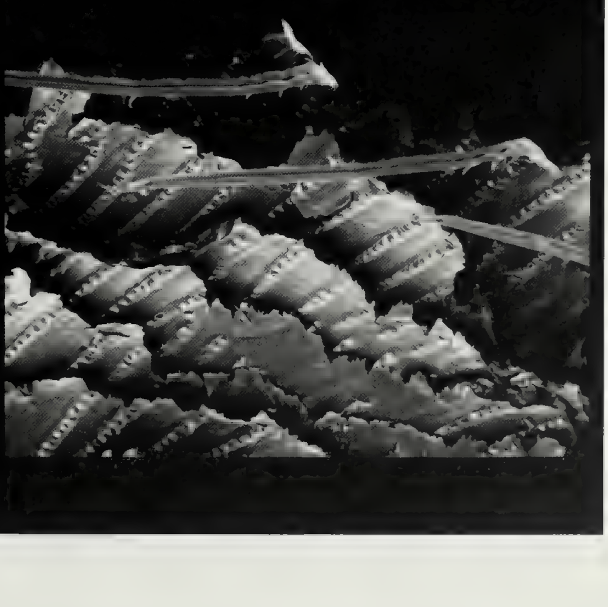


15

16



17



Material examined.

- 1 shell, collected without animal, from off Mauritania, 17°18'N, 16°32'W, plateau continental, N. O. N'Diago, station 181, 104m deep, B. Richer de Forges coll, 1981. Deposited at MNHN and designated here as holotype MNHN 22611, 55.8 mm x 13.7 mm (Figs 8, 9) (protoconch with holotype in separate tube). The operculum was previously examined by A. Warén but is no longer available (Figs 16, 17).
- 1 shell, collected without animal, from off Mauritania, 18°36' N, 16°31'W, plateau continental, N. O. N'Diago campagne 1981, station 118, 96m deep, Richer de Forgers-ORSTOM coll. 29/10/1981, Designated here as paratype 1 MNHN 22612. 62.2 mm x 14.5 mm (Fig. 10).
- 1 shell, collected without animal, from Cap Barbas, Western Sahara, trawled by fishermen in 50-60m, May 2001, In collection C. Vos ref. TU517 (ex-coll. Marthe Bellocq, Spain), designated here as paratype 2, 53.8 mm x 13.2 mm (Figs 11, 12).
- 3 shells, collected without animal, trawled at 50/60 m. off Western Sahara, in collection P. Ryall (ex-coll. Marthe Bellocq, Spain), 49.3 mm, 51.7 mm and 66.4 mm. The 66.4 mm specimen is designated here as paratype 3 (not figured).
- 1 shell, collected without animal, from off Cap Barbas, Western Sahara, trawled by fishermen in 50-60m, May 2001, deposited at SMNH, catalogue number 6105 (ex-collection C. Vos from coll. M. Bellocq) and designated here as paratype 4 (not figured), 46 mm.
- 1 shell, collected without animal, MNHN, Au large du Cap Blanc, Mauritania, 20° 38' N, 17° 37' W, prof. 110m, "Leon Coursin"; st. 10, 20-2-1957, coll. I. Marche-Marchad (which he labelled '*T. cochlea', auct.*). 29.0 mm x 7.8 mm
- 1 shell, collected without animal, MNHN, Région de Dakar (Sénégal), "Gérard Tréca", 14°49'N, 17°34'W, 150m, 7-1-1958, Coll. Marche-Marchad (which he labelled as "?Turritella cochlea Reeve (var ex coloré) "G.T" " (where "G. T." stands for Gérard Tréca, *auct.*). 37.7 mm x 9.8 mm
- 3 shells, collected without animal, MNHN, form off Mauritania, Plateau Continental, N/O N'Diago, st. 303 19°00'N, 16°42'W, at 120m. B. Richer de Forges coll. 1981. 20.0 mm x 5.5 mm; 9.2 mm x 2.9 mm; 6.6 mm x 2.3 mm
- 1 shell, collected without animal, MNHN, from off Mauritania, Plateau Continental, N.O. N'Diago, St. 354, 19°42'N, 17°01'W, at 98m, B. Richer de Forges coll., 1981. 43.8 mm x 11.5 mm
- 1 shell, collected without animal, MNHN, from off Gabon, Golfe de Guinée, Calypso, 1950, 0°25'N, 9°00'E, at 73m. 27.7 mm x 7.8 mm.
- 1 shell, collected without animal, MNHN, Président Th. Tissier (1936), St. 691, 20°34'N, 17°47'W, at 90m. 35.7 mm x 10.0 mm
- 1 shell, collected without animal, MNHN, from off Mauritania, Plateau Continental, N/O N'Diago, st. 173, 17°12'N, 16°32'W, 106m, B. Richer de Forges coll. 1981, 52.7 mm x 12.9 mm.
- 1 shell, collected without animal, MNHN, Région de Dakar (Sénégal), "Tenace"-dragage 2, 14°50'01"N, 17°29'03"W, at 150m, 15-3-1967, Coll. Marche-Marchad. 30.6 mm x 8.7 mm
- 1 shell, collected without animal, MNHN, from off Mauritania, Plateau Continental, N/O N'Diago, st. 176, 17°12'N, 16°41'W, 170m, B. Richer de Forges coll. 1981, 26.5 mm x 7.2 mm.
- 2 shells, collected without animal, MNHN, Région de Dakar (Sénégal), "Gérard Tréca", Dans le nord vrai des Almadies, 14°51'5"N, 17°30'W, at 165-180m, 18-02-1958. Coll. Marche-Marchad. 26.3 mm x 7.2 mm ; 27.5 mm x 7.1 mm
- 1 shell, collected without animal, MNHN, I. Marche-Marchad, 1960, Bull. I.F.A.N., t. XXII, sér. A, n° 3, p. 860, Fig. 12, Baie de Gorée. At 150m. Determined and figured by I. Marche-Marchad as *Archimediella cochlea* Reeve. 34.5 mm x 9.0 mm,
- 2 shells, collected without animal, CPR, dredged – 80 m. off Cayar, Senegal, 46.3 mm & 45.8 mm
- 1 shell, collected without animal, Coll. Frank Swinnen (Lommel, Belgium), from off Mauritania, from fishermen. 51.3 mm x 11.7 mm
- 2 shells, collected without animal, Coll. Frank Swinnen (Lommel, Belgium), from off Ad Dakhla, Western Sahara, dredged 60-80m deep, 43.9 mm x 11.2 mm; 80.5 mm x 11.6 mm

Distribution range. Known from Western Sahara to the Gulf of Guinea, Gabon.

Habitat. From the examined material it is concluded that this species lives at depths of 80 – 150 m, where it lives in sand and mud.

Dimensions. Average size of the examined material around 35 mm. Largest examined specimen (Coll. F. Swinnen) measures 80.5 mm.

Description. Shell tall, slender, strongly bicarinate, mottled with axial brownish blotches, more distinct where they cross the keels. Protoconch partly crushed in the best preseved specimen, but it seems to have consisted of 1.5 whorls. The first teleoconch whorl has a single strong keel, on the third whorl appears a much weaker spiral cord below this, plus a few still weaker spiral lines. The seventh whorl, diameter 2.0 mm, starts to appear bicarinate, with a more prominent apical keel. At the 13th whorl, the keels are of about the same size and the holotype has 20 whorls. The surface of the whorls is covered by a rather uniform sculpture of ca. 40 spiral striae, covering also the two main keels. There is also a microsculpture of about 5-8 much finer lines for each striae. The axial sculpture consists of weak incremental lines and more scattered scars. The outer lip is shallowly sinuated with its deepest part situated between the two keels.

Operculum. The operculum of the holotype was examined and used for SEM photography (Figs 16, 17), though is no longer available. It had numerous coils with uneven, fringed edges partly overlapping the subsequent whorl and was sculptured with radial rows of small spines (detail Fig. 17).

Etymology. Named after Anders Warén, Senior Curator of Mollusca at the Swedish Museum of Natural History, Stockholm - who first drew our attention to this unnamed species - in appreciation for the enormous support and preliminary research to this description, support to the authors and in honour of his elaborate knowledge and experience with the Turritellidae family.

Remarks. Marche-Marchad (1958: 16; 1960: 860) used the name *T. cochlea* Reeve, 1849 for this species. The original labels show that he was unsure of the determination, as the names are mostly put between quotes.

Reeve (1849, Pl. VII, species 29; holotype and 2 paratypes in NHM, London) described *T. cochlea* without mention of locality. The name *T. cochlea* was later on correctly used by Bosch et al. (1995: 58) for a species living off eastern Arabia.

Turritella aurocincta Martens, 1882, (syntypes ZMB, examined from photographs) was mentioned as a synonym by Bosch et al. (1995) but has no relation to *T. cochlea* Reeve, 1849. It is considered a junior synonym of *Turritella cingulifera* Sowerby, 1825, the most common and widely distributed of the Indo-Pacific Turritellidae. *T. cochlea* Reeve, 1849 is similar to *T. wareni* sp.nov., but in addition to living in a distinctly different area, its spiral keels are already of the same size at a diameter of less than 1 mm.

Turritella bicingulata Lamarck, 1822 (3 syntypes in MHNG reg. no. 1097, examined on photographs) is a much more sturdy built species with a more reddish coloured shell with fewer whorls and of which the keels are much less prominent and dominating. It was described (Lamarck, 1822: 58) without mention of locality and currently considered to be restricted to the Cape Verde Islands.

The apical whorls of *T. wareni* sp. nov. show most resemblance in style to *Turritella annulata* Kiener, 1843, but that species has a less strong bicarinate shell and coarser secondary sculpture. *T. annulata* occurs from Dakar in Senegal to southern Angola (Marche-Marchad, 1960).

ACKNOWLEDGEMENTS

We wish to express our gratitude (in no particular order) to:

Anders Warén (SMNH, Sweden) for the enormous amount of work done preceding this article, re-reading and loan of his extensive documentation on Turritellidae. Philippe Bouchet, Rudo Von Cosel, Virginie Héros (MNHN, Paris), for the loan of a large amount of material, re-reading and access to vital information and type material. Yves Finet (MNHG, Geneva) for access to type material (during the preliminary research by A. Warén). Kathie M. Way (NHM, London) for access to type material (during the preliminary research by A. Warén). Christfried Schönherr (Luanda, Angola) for the loan of specimens. Marthe Bellocq (Marbella, Spain) for assistance with specimens of *T.* wareni sp. nov.

The authors would also like to thank master Kenneth Vos (Scherpenheuvel, Belgium) for the photography of the type material and some of the material from the second author's collection.

REFERENCES

Adams, A. & Reeve, L. A. 1850. The zoology of the voyage of H.M.S. Samarang under the command of Captain Sir Edward Belcher ... during the years 1843-1846; Reeve, Benham, and Reeve, King William Street Strand, 1848. Vol. I. [1], xxxix, [1], 358, 2, 8 p., [27] leaves of plates; Vol. II. [1], [2], 574, [2] p., [5] leaves of plates.

Bandel, K. 2006. Families of the Cerithioidea and related superfamilies (Paleo-Caenogastropoda; mollusca) from the Triassic to the Recent characterized by protoconch morphology – including the description of new taxa. *Paläontologie, Stratigraphie, Fazies* (14), *Freiberger Forschungshefte*, C 511: 59-138.

Beesley, P. L., Ross, G. J. B. & Wells, A. eds. 1998 [January]: *Mollusca: the southern synthesis. Fauna of Australia*, 5. Melbourne, CSIRO. Part A: xvi + 563 pp; Part B: viii + 565-1234 pp.

Bosch, D.T., Dance, P., Moolenbeek, R. & Oliver, P.G. 1995. *Seashells of eastern Arabia*. Motivate Publishing, Dubai, 296 pp.

Cossmann, M. & Peyrot, A. 1921. Conchologie néogénique de la Bassin de l'Aquitaine. 3. *Bulletin de la Société Linnéenne de Bordeaux* 73: pp. 1-321.

Dautzenberg P. 1910. Contribution á la faune Malacologique de l'Afrique occidentale. *Actes Société Linnéenne de Bordeaux*, pp. 1-174.

Garrard, T. A. 1972. A Revision of Australian Recent and Tertiary Turritellidae (Gastropoda : Mollusca). *Journal of the Malacological Society of Australia* 2(3): 267-338.

Gofas, S., Pinto Afonso, J. & Brandao, M. 1985. *Coquillages et Mollusques d'Angola*. Universidade Agosthino Neto, Luanda, 144 pp.

Kiener, L. C. 1844. Species général et iconographie des coquilles vivantes. Paris. 10. *Turritella*, 46 pp., 12 plates.

Lamarck, J. B. de Monet, Chevalier de 1799. *Mémoires de la Société d'Histoire Naturelle de Paris*. Paris, Baudoin, Imprimeur du Corps législatif et de l'Institut national, place du Carrousel, n" 662. Prairial, AN VII, 171 pp., 10 pl.

Lamarck, J. B. de Monet, Chevalier de 1822. *Histoire Naturelles des Animaux sans Vertèbres*, Tome septième, Paris, Chez l'auteur, Au jardin du Roi, Aout, 1822, De L'imprimerie de Guiraudet, Rue St.-Honoré, n°. 515, vis-à-vis St.-Roch., pp. 711.

Marche-Marchad, I. 1958. Nouveau catalogue de la collection des mollusques testacés marins de l'I.F.A.N. *Bulletin de l'Institut Français d'Afrique Noire* Ser. A 20(14): 1-64.

Marche-Marchad, I. 1960. Les Turritellidae de l'Afrique Occidentale (Gasteropodes Prosobranches marins). *Bulletin de l'Institut Français d'Afrique Noire* Ser. A 22: 853-883.

Reeve, L. A. 1849. *Monograph of the genus Turritella. Conchologia Iconica* 5, Reeve, Benham and Reeve, King William Street Strand, London,11 pl.

A remarkable new species of *Zacatrophon* Hertlein & Strong, 1951 (Gastropoda: Muricidae: Ocenebrinae) from the Gulf of California

Roland HOUART
Research Associate, Institut royal des Sciences naturelles de Belgique
rue Vautier, 29, 1000 Bruxelles, Belgium.
roland.houart@skynet.be

KEYWORDS. Gastropoda, Muricidae, Gulf of California, *Zacatrophon*, new species.

ABSTRACT. *Zacatrophon skoglundae* n.sp. is described from the Gulf of California and compared with *Zacatrophon beebei* (Hertlein & Strong, 1948), *Austrotrophon cerrosensis* (Dall, 1891) and *A. catalinensis* (Oldroyd, 1927). The radula characters are illustrated for *Forreria* Jousseaume, 1880, *Zacatrophon* Hertlein & Strong, 1951 and *Austrotrophon* Dall, 1902. The three genera are included in Ocenebrinae Cossmann, 1903.

RESUME. *Zacatrophon skoglundae* n.sp. est décrit du Golfe de Californie et est comparé à *Zacatrophon beebei* (Hertlein & Strong, 1948), *Austrotrophon cerrosensis* (Dall, 1891) et *A. catalinensis* (Oldroyd, 1927). Les caractéristiques de la radula sont illustrées pour *Forreria* Jousseaume, 1880, *Zacatrophon* Hertlein & Strong, 1951 et *Austrotrophon* Dall, 1902. Les trois genres sont inclus dans les Ocenebrinae Cossmann, 1903.

INTRODUCTION

The new species described herein was previously published as *Forreria (Zacatrophon) beebei* (Hertlein & Strong, 1948) by Myers & Hertz (1990). After a careful study of many specimens and comparison with the type species of *Zacatrophon*, it turned out to be a new species.

Repository

ANSP: Academy of Natural Sciences of Philadelphia, U.S.A.
CAS: California Academy of Sciences, San Francisco, U.S.A.
IRSNB: Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
SBMNH: Santa Barbara Museum of Natural History, California, U.S.A.
USNM: National Museum of Natural History, Washington, D.C., U.S.A.
CS: coll. Carol Skoglund
DP: coll. Don Pisor
RH: coll. Roland Houart

Other abbreviations

IP :	Infrasutural primary cord (primary cord on subsutural ramp)
P1 :	Shoulder cord
P2-P3 :	Primary cords of the convex part of the teleoconch whorl

SYSTEMATICS

Family **MURICIDAE** Rafinesque, 1815
Subfamily **OCENEBRINAE** Cossmann, 1903
Genus ***Zacatrophon*** Hertlein & Strong, 1951
Type species by original designation: *Trophon (Zacatrophon) beebei* Hertlein & Strong, 1948, Recent, Gulf of California..

Zacatrophon skoglundae n. sp.
Figs 1-6

Material examined. The holotype and 12 paratypes from the Skoglund Collection were examined and distributed to the following museums and private collections:
Holotype SBMNH 423912.
Paratypes: 1 ANSP 423438; 1 CAS CASIZ 182027; 1 IRSNB IG 31.468/MT2241; 1 MNHN 22716; SBMNH 423913; 1 USNM 1133478; 2 RH (no registration number) (all from the type locality); 4 CS (no registration number), from three miles SE of Punta San Antonio, Sonora, Mexico. Dredged, 60 to 90 m, by Paul & Carol Skoglund Nov. 1982

Type locality. Gulf of California, Baja California Sur, Mexico, brought in San Juanico by shrimpers.

Other material examined. *Zacatrophon skoglundae* n.sp.: Gulf of California, Baja California Sur, Mexico, San Juanico taken by shrimpers (4 specimens, 54 to 70.5 mm in length, CS); Near Loreto, Baja California Sur, Mexico (1 specimen, 64 mm in length, CS).
Zacatrophon beebei: Gulf of California (1); Cabo San Lucas, Gulf of California (1); Ceralbo Island, West

Mexico (24°18'51"N; 109°55'30"W) (2) (all coll. RH); Cabo San Lucas, Gulf of California, dredged 46 m (5) (coll. CS) (Figs 7-13).
Austrotrophon cerrosensis: Gulf of California (1) (coll. RH); Off Cedros Island, Baja California (3) (coll. CS) (Figs 14-16).
Austrotrophon catalinensis: San Pedro, California (1) (coll. RH); Catalina Island, California (1); Baja California, 27°28.3' N, 114°57.0'W, 110 m (1); Off San Diego, California, 77 m (1) (all coll. DP) (Figs 17-18).
Austrotrophon sp. Off NW Isla Smith, Bahía de Los Angeles, Baja California, Mexico, dredged 183 m (CS) [as *Trophon (Austrotrophon)* cf. *cerrosensis* in Skoglund (1988: 115, Fig. 10)] (Figs 19-20).

Description. Shell large for the genus, up to 72 mm in length at maturity, length/width ratio 1.7-2.2:1. Slender, elongate, narrow, lightly built. Subsutural ramp broad, tabulate, weakly convex.
Creamy-white, light tan or tan. Flat lamellae of last teleoconch whorl usually weakly darker colored. Lighter coloured spiral band at adapical extremity of siphonal canal. Aperture glossy white.
Spire high, up to 5 or 5.5 narrow, strongly shouldered, spinose, loosely coiled whorls. Suture deeply excavated, strongly impressed. Protoconch unknown, broken in all examined specimens. Axial sculpture of teleoconch whorls consisting of low, broad, flattened lamellae, more strongly developed at shoulder, producing short or long, broad, flat, guttered, spinelike projections. First teleoconch whorl eroded in all examined specimens; second whorl with 10 or 11 ribs with small, broad, shoulder spinelets; third whorl with 9 or 10 flat, almost undistinguishable ribs with flat, open spinelets at shoulder; fourth whorl with 8-10 flat lamellae, producing short or long, flat spinelets at shoulder; last whorl with 7-10 low, flat, axial lamellae, generally ending as long, upward curved, flat, guttered, open, spinelike projections at shoulder. Spiral sculpture consisting of P1, and when present, of very low, almost undistinguishable P2 and P3 on second and third whorl. Other whorls smooth or with very low, broad, concentrated, spiral cords, extending also on siphonal canal. Subsutural ramp smooth, except axial lamellae.
Aperture large, broad, rounded, with adapical portion starting at base of preceding whorl. Columellar lip broad, entirely smooth, rim completely adherent. Outer lip smooth, with smooth surface within. Siphonal canal long, broad, straight or weakly dorsally curved, broadly open, with low axial lamellae over whole length.
Operculum and radula unknown.

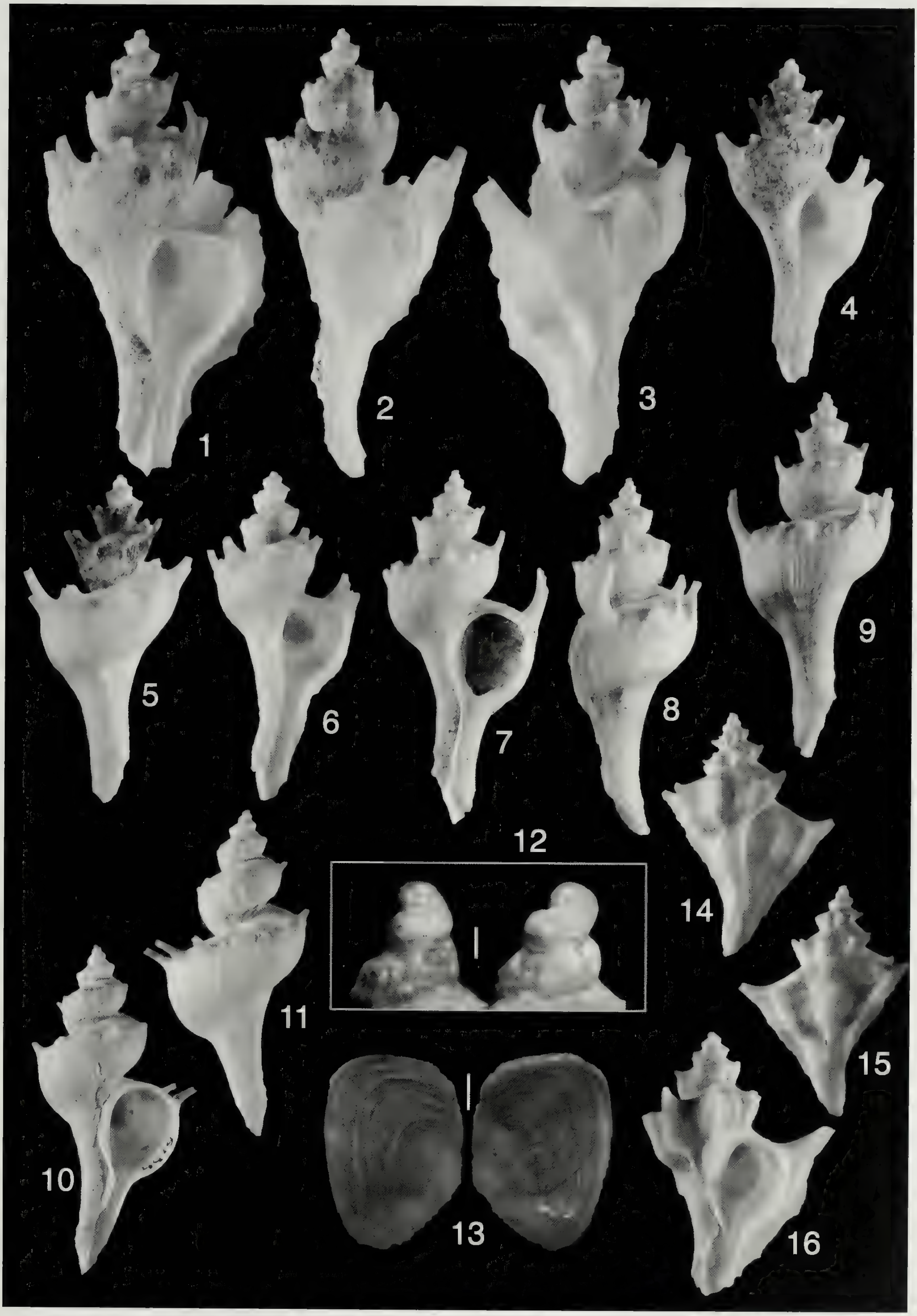
Remarks. Compared to *Zacatrophon beebei* (Figs 7-13, 21-23), the only other representative of the genus, *Z. skoglundae* n.sp. has broader, fewer, and more strongly developed, flat, shoulder spines (8-10 *vs* 10-15 in *Z. beebei*), less convex teleoconch whorls, especially remarkable at the last whorl, and more strongly developed axial lamellae. The new species apparently also reach a larger size.
Zacatrophon skoglundae n. sp. differs from *Austrotrophon cerrosensis* (Figs 14-16, 24-26) and *A. catalinensis* (Figs 17-18, 27-29, two species assigned to *Austrotrophon* Dall, 1902, a related genus, in having the typical loosely coiled teleoconch whorls with deeply impressed suture, and a tabulate subsutural ramp, typical features of *Zacatrophon.* Moreover, it also differs from *A. cerrosensis* in the absence of obvious spiral sculpture, in the more numerous axial lamellae (8-10 *vs* 6-8) and in the strongly upward curved and flatter shoulder spines. From *A. catalinensis* it also differs in the more numerous and less developed axial lamellae, more strongly upward curved, less developed spines, and comparatively smaller size.

Etymology. I am very pleased to name that species for Carol Skoglund who kindly put many of her specimens at my disposal for study.

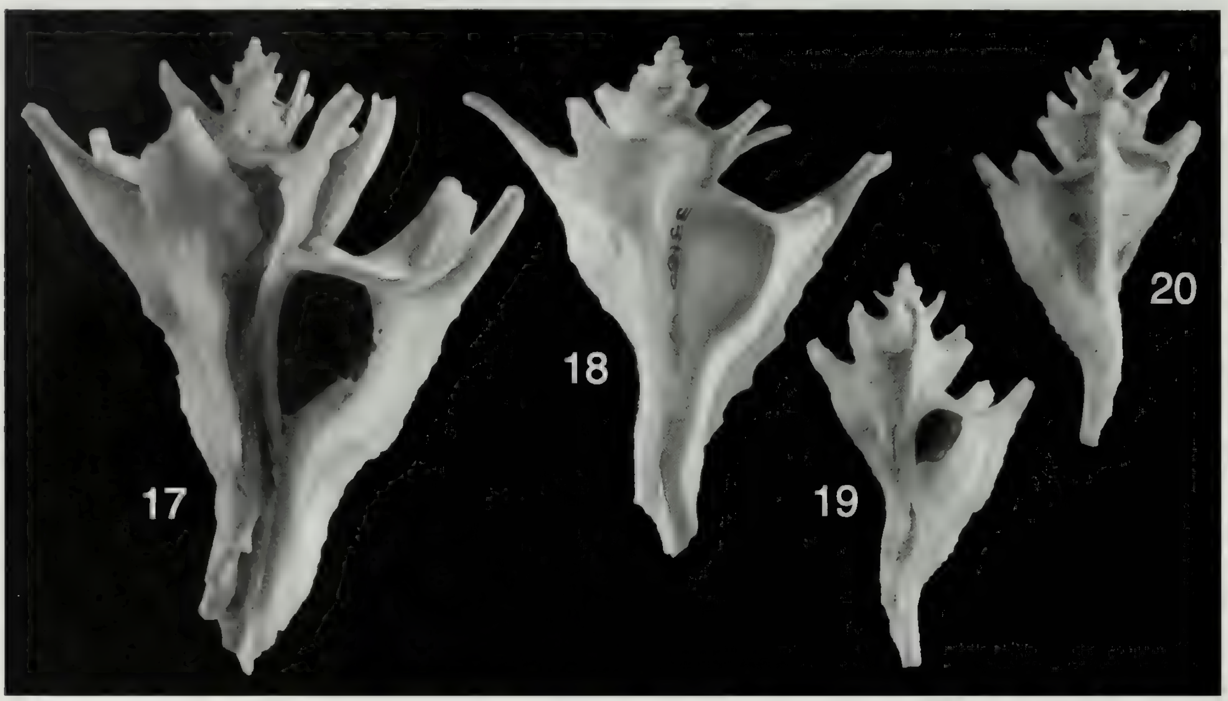
Discussion. *Zacatrophon*, *Austrotrophon*, *Forreria* and the species related to these taxa were the subject of several different assignations:
- Hinds (1844: 127) described *Murex belcheri*. It was assigned to *Forreria* by Jousseaume (1880: 335).
- Dall (1891: 181) described *Trophon cerrosensis* and assigned it later to *Austrotrophon* as *Trophon (Austrotrophon) cerrosensis* (Dall, 1902: 549).

Figures 1-16

1-6. *Zacatrophon skoglundae* n.sp.
1-3. Gulf of California, Baja California Sur, Mexico, brought in San Juanico by shrimpers Holotype SBMNH 423912, 72 mm; **4-5.** paratype, same locality, MNHN 22716, 41.8 mm; **6.** paratype, same locality, USNM 1133478, 41.6 mm
7-13. *Zacatrophon beebei* (Hertlein & Strong, 1948)
7-9. Cabo San Lucas, Gulf of California, dredged 46 m, (CS), 47.5 mm; **10-11.** Ceralbo Island, West Mexico (24°18'51"N; 109°55'30"W), (RH), 40.9 mm; **12.** Protoconch (CS), scale bar 0.5 mm; **13.** Operculum (CS), scale bar 2 mm.
14-16. *Austrotrophon cerrosensis* (Dall, 1891)
14-15. Off Cedros Island, Baja California, (CS), 35 mm; **16.** Gulf of California, (RH), 52.2 mm.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

- Oldroyd (1927: 29) described *Trophon (Austrotrophon) catalinensis* from San Pedro, California.
- Hertlein & Strong (1948: 79) described *Trophon beebei*. Three years later they proposed *Zacatrophon* as subgenus of *Trophon* Montfort, 1810 for *Trophon* (*Zacatrophon*) *beebei* (Hertlein & Strong, 1951: 86).
- Keen (1971: 537) included *Zacatrophon* and *Austrotrophon* in Trophoninae as subgenera of *Trophon*. The genus *Forreria* was not discussed.



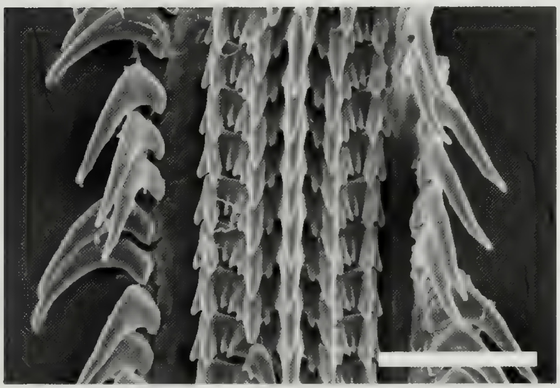
Figures 17-20

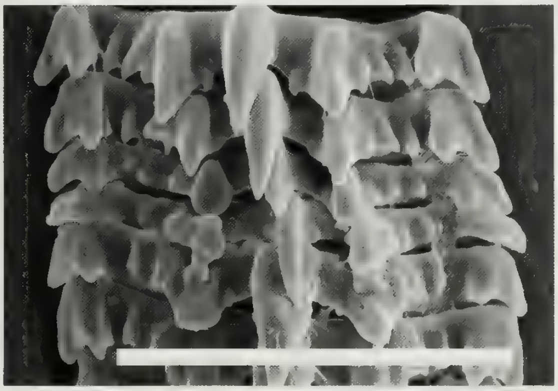
17-18. *Austrotrophon catalinensis* (Oldroyd, 1927)
17. San Pedro, California, (RH), 80.2 mm; **18.** Catalina Island, California, (DP), 56.9 mm.
19-20. *Austrotrophon* sp. Off NW Isla Smith, Bahía de Los Angeles, Baja California, Mexico, 183 m, (CS), 36.9 mm.

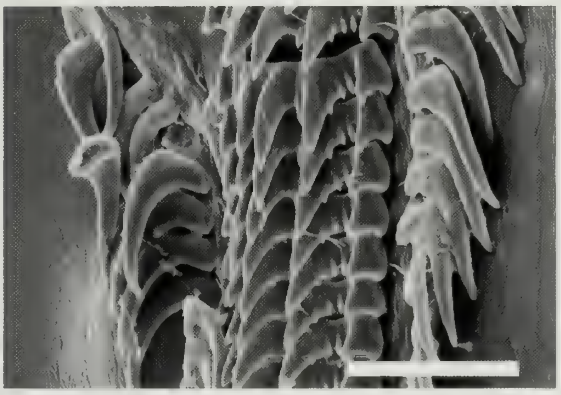
- Abbott (1974) included *Forreria* in Rapaninae (1974: 171) and *Zacatrophon* and *Austrotrophon* in Trophoninae, as subgenera of *Trophon* (1974: 191).
- Radwin & D'Attilio (1976: 176) listed all these taxa in Thaididae.
- Vaught (1989: 45) listed these taxa in Rapaninae.
- Myers & Hertz (1990) illustrated radula and operculum characters of *Zacatrophon* and included the three taxa in Thaidinae. They also considered *Zacatrophon* and *Austrotrophon* as subgenera of *Forreria* notwithstanding the strong labral tooth in the latter, absent in *Zacatrophon* and *Austrotrophon*.
- Kool (1993) illustrated shell, operculum and radula characters of *Forreria* (1993: 164, fig. 1D; 228, fig. 26) and noted that phylogenetic analysis revealed close relationship among Ocenebrinae Cossmann, 1903 and *Forreria*, and excluded it from Rapaninae.
- McLean (1996: 82) followed Kool (1993) and placed *Austrotrophon* in Ocenebrinae.
- Vokes (1996: 6) Also included *Austrotrophon* and *Zacatrophon* in Ocenebrinae but retained both as subgenera of *Forreria*.

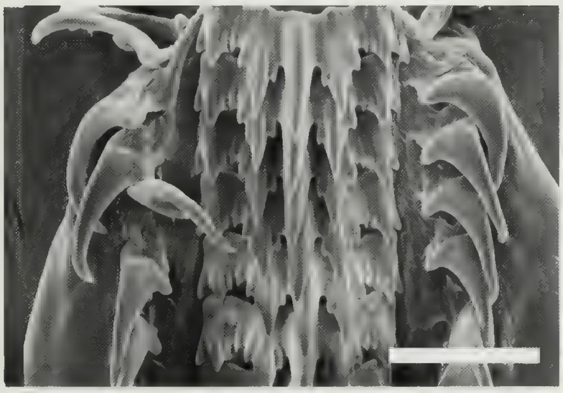
Figures 21-28. SEM of radulae

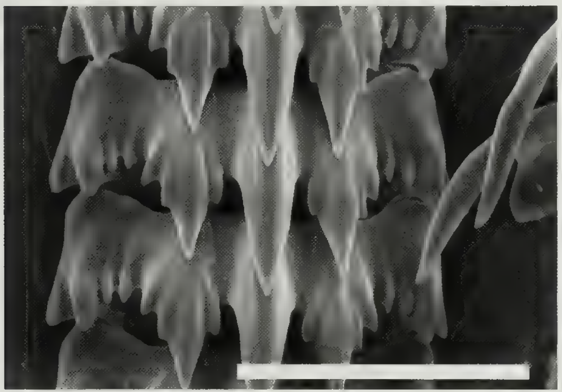
21-23. *Zacatrophon beebei* (Hertlein & Strong, 1948), Mexico, Sonora, Guaymas, 27°52'12" N, 110°50'60" W, SBMNH 93431 (scale bars: 100 μm).
24-26. *Austrotrophon cerrosensis* (Dall, 1891), Mexico Baja California, Bahia Sebastian Vizcaino; dredged Latitude: 28°26'30" N, 114°35'60" W, SBMNH 93378 (scale bars: 24-25: 100 μm; 26: 200 μm).
27-28. *A. catalinensis* (Oldroyd, 1927), California, Los Angeles County, San Pedro Bay, 33°40'40" N, 118°17'32" W, SBMNH 100258 (scale bars: 27: 100 μm; 28: 200 μm).

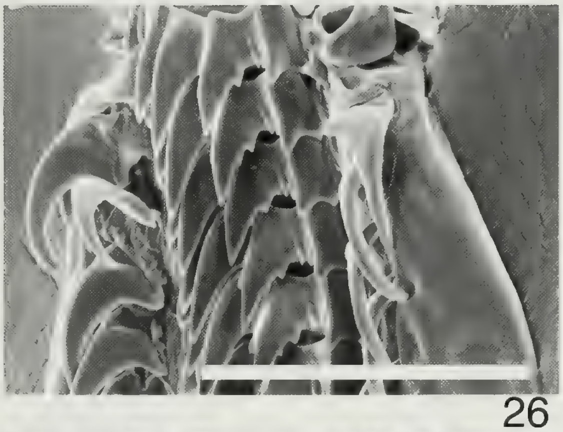

21

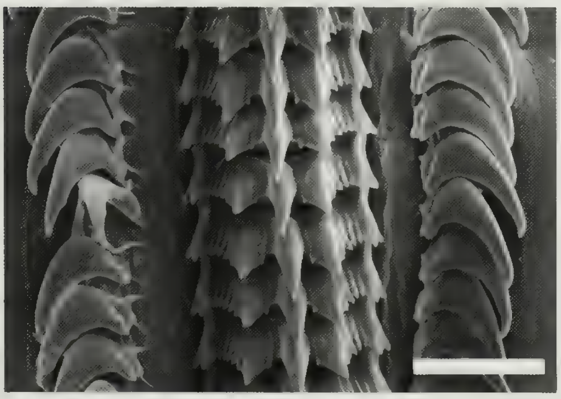

22

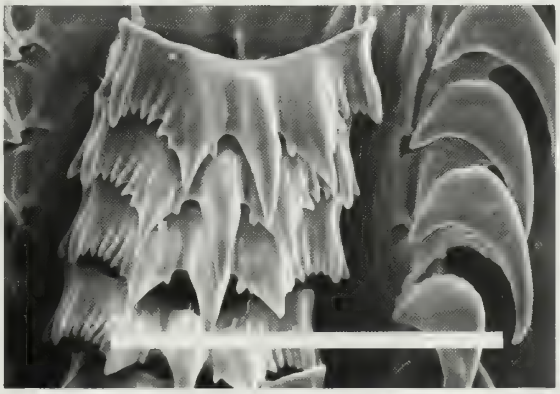

23


24


25


26


27


28

The radula of *Zacatrophon*, *Austrotrophon* and *Forreria* (Figs 21-32) is closely related to Ocenebrinae, having the rachidian tooth with a projecting central cusp, a long lateral cusp with inner and outer lateral denticles on base, several marginal cusps and an obvious marginal cusp, as seen in *Ocenebra* Gray, 1847 (Figs 33-34) and *Nucella* Röding, 1798 (Figs 35-36).

Due to close relationship of shell, operculum and radula characters in *Ocenebra*, *Nucella*, *Forreria*, *Zacatrophon* and *Austrotrophon* (except the presence of a labral tooth in *Forreria*), I will also follow Kool (1993) and McLean (1996) and group all these taxa as separate genera within Ocenebrinae.

ACKNOWLEDGEMENTS

I am very grateful to Carol Skoglund, Phoenix, Arizona, U.S.A for the loan and gift of many specimens from her collection, and for the correction of the first draft of this paper. I am also most indebted to Henry W. Chaney and to Daniel Geiger, Santa Barbara Museum of Natural History, California, U.S.A., for extracting the radulae and for the Scanning Electron Microscope photographs of *Zacatrophon*, *Austrotrophon* and *Forreria*, and to Anders Warén (Natural History Museum, Stockholm, Sweden) for preparation and SEM work of the radulae of *Ocenebra* and *Nucella*). Thanks also to H.W. Chaney and to Virginie Héros (Muséum national d'Histoire naturelle, Paris, France), for bibliographic research, and to Don Pisor, San Diego, California, U.S.A for the loan of some comparative material.

REFERENCES

Abbott, R.T. 1974. American Seashells, 2nd. Ed. Van Nostrand Reinhold, N.Y., 663 pp.

Dall, W. H. 1891. Scientific results of explorations by the U.S. Fish Commission steamer "Albatross". XX. On some new or interesting West American shells obtained from the .. "Albatross", 1888, and from other sources. *Proceedings of the U.S. National Museum* 14(849): 173-191.

Dall, W.H. 1902. Illustrations and descriptions of new, unfigured or imperfectly known shells, chiefly American, in the U.S. National Museum. *Proceedings of the U.S. National Museum* 24(1264): 499-566.

Hertlein, L.G. & Strong, A.M. 1948. Descriptions of a new species of *Trophon* from the Gulf of California. *Bulletin of the South California Academy of Sciences* 46(2): 79-80.

Hertlein, L.G. & Strong, A.M. 1951. Eastern Pacific expeditions of the New York Zoological Society. Mollusks from the west coast of Mexico and Central America. Pt. 10, vol. 36(2): 67-120.

Hinds, R.B., 1844. Descriptions of new species of *Scalaria* and *Murex* from the collection of Sir Edward Belcher, C.B. *Proceedings of the Zoological Society of London* (1843), 12:124-129

Keen, A.M.1971. Sea Shells of Tropical West America, 2d Ed. Stanford University Press, Stanford, Calif., 1064 pp.

Jousseaume, F. 1881. Diagnoses de mollusques nouveaux. *Le Naturaliste* 44: 349-350.

Kool, S.P. 1993. Phylogenetic analysis of the Rapaninae (Neogastropoda: Muricidae). *Malacologia* 35(2): 155-259.

McLean, J.H. 1996. Taxonomic Atlas of the benthic fauna of the Santa Maria Basin and Western Santa Barbara Channel. Vol. 9 - The Mollusca Part 2 - The Gastropoda - The Prosobranchia. Santa Barbara Museum of Natural History: 1-160.

Myers, B.W. & Hertz, C.M. 1990. *Forreria (Zacatrophon) beebei* (Hertlein & strong, 1948) (Muricidae: Thaidinae). *The Festivus* 22(4): 32-36.

Oldroyd, I.S. 1927. The marine shells of the west coast of North America. Stanford University Publications, Univ. series, Geological Science, vol. 2, Gastropoda, Scaphopoda and Amphineura, pt. 2, pp. 1-304, pls. 30-72

Radwin, G.E. & D'Attilio, A. 1976. *Murex* Shells of the World. An illustrated guide to the Muricidae. Stanford University Press, Stanford, 284 pp.

Skoglund, C. 1988. Deep water shells from off Isla Smith, Bahía de Los Angeles, Baja California, Mexico. *The Festivus* 20(11): 110-116.

Vaught, K.C.1989. A Classification of the Living Mollusca. American Malacologists, Melbourne, Fla, i-xii, 189 pp.

Vokes, E.H. 2002. One last look at Muricidae. *American Conchologist* 24(4): 4-6.

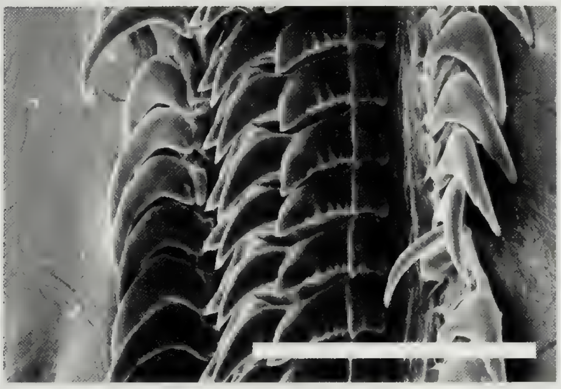
Figures 29-36. SEM of radulae

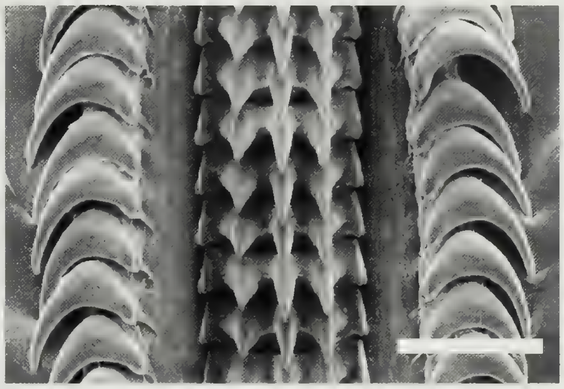
29. *Austrotrophon catalinensis* (Oldroyd, 1927), California, Los Angeles County, San Pedro Bay, 33°40'40" N, 118°17'32" W, SBMNH 100258 (scale bars: 200 µm).

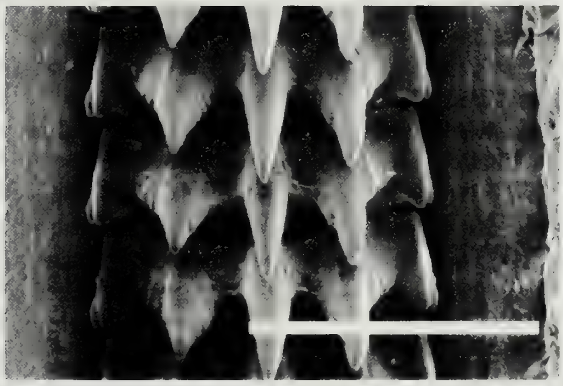
30-32. *Forreria belcheri* (Hinds, 1844). California, Los Angeles County, 33°42'0" N, 118°16'0" W, SBMNH 99550 (scale bars: 200 µm).

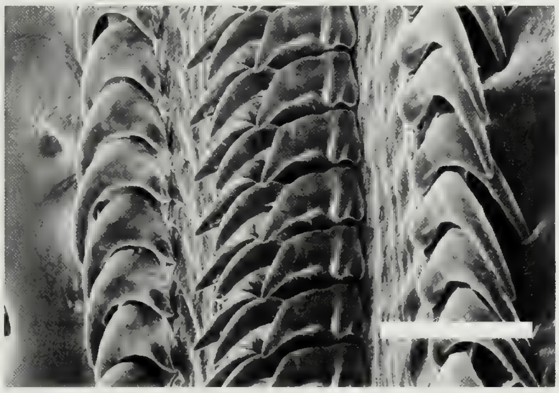
33-34. *Ocenebra erinaceus* (Linnaeus, 1758), France, Brittany, Oleron (RH) (scale bars: 33: 10 µm; 34: 20 µm).

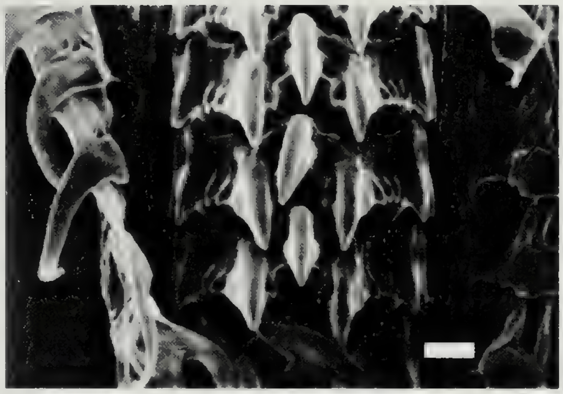
35-36. *Nucella heyseana* Dunker, 1882, Korea, Sokch'o (RH) (scale bars: 35: 100 µm; 36: 10 µm).

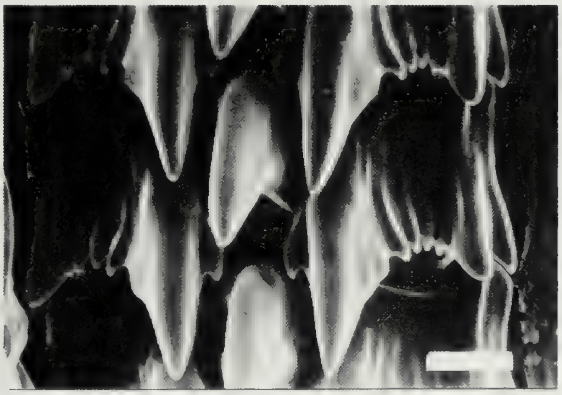

29

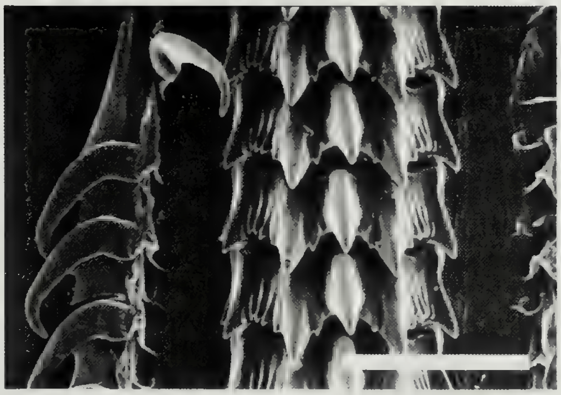

30

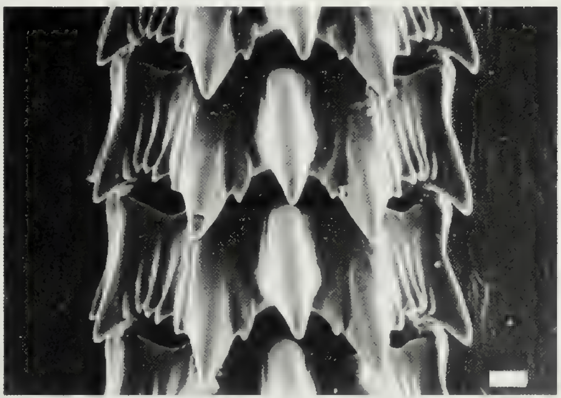

31


32


33


34


35


36

Description of a new species from Indonesia in the *Murex scolopax* group (Mollusca: Gastropoda: Muricidae) and comments about *Murex (Murex) ternispina* Lamarck, 1822 from East Java

Roland HOUART
Research Associate, Institut royal des Sciences naturelles de Belgique
rue Vautier, 29, 1000 Bruxelles, Belgium.
roland.houart@skynet.be

KEYWORDS. Gastropoda, Muricidae, Moluccas, Arafura, East Java, *Murex* s.s., new species, new colour form.

ABSTRACT. *Murex spinastreptos* n.sp. is described from Indonesia and compared with *Murex occa* Sowerby, 1834 and *M. coppingeri* Smith, 1884. A rare colour form of *M. ternispina* Lamarck, 1822 from Java is commented on and illustrated.

RESUME. *Murex spinastreptos* n.sp. est décrit d'Indonésie et est comparé à *Murex occa* Sowerby, 1834 et à *M. coppingeri* Smith, 1884. Une variété de couleur de *M. ternispina* Lamarck, 1822 de Java est commentée et illustrée.

INTRODUCTION. Radwin & D'Attilio (1976) listed 17 Indo-West Pacific species in the genus *Murex*. From these taxa, 10 were transferred to other genera or subgenera by Ponder & Vokes (1988), Houart (1992) and Houart (1999). The seven remaining species in Radwin & D'Attilio (1976) are: *M. brevispina* Lamarck, 1822, *M. coppingeri* E. A. Smith, 1884, *M. pecten* Lightfoot, 1786, *M. scolopax* Dillwyn, 1817, *M. trapa* Roding, 1798, *M. tribulus* Linnaeus, 1758 and *M. troscheli* Lischke, 1868.

Afterwards, the genus *Murex* s.s. was revised by Ponder & Vokes (1988) who named nine new species or subspecies. They also reconsidered the classification of Radwin & D'Attilio (1976) and reinstated several names considered as synonyms or not listed by these authors, bringing the total of species and subspecies in *Murex* s.s. to 26. Two species were not recognized in Ponder & Vokes (1988), one, *Murex concinnus* Reeve, 1845, considered as synonym, the other, *Murex surinamensis* Okutani, 1982, was originally described from Suriname, in the Western Atlantic.

A neotype was designated for *M. concinnus* in Parth (1990: 42), who separated the taxon at the specific level and *Murex surinamensis* was proved to originate from the Saya de Malha Bank, in the Indian Ocean by Bouchet & Bail (1991: 160) and Okutani (1991: 165).

Five new species were described after 1988, updating the total of *Murex* s.s. species from the Indo-West Pacific to 33, which is here increased to 34 with the new species described below.

Repository

IRSNB. Institut royal des Sciences naturelles de Belgique, Bruxelles, Belgium.
MNHN. Muséum national d'Histoire naturelle, Paris, France.
RH. Collection of the author.

P :	Primary cord
s :	secondary cord
ad :	adapical
ab :	abapical
IP :	Infrasutural primary cord (primary cord on subsutural ramp)
adis :	adapical infrasutural secondary cord (on subsutural ramp)
abis :	abapical infrasutural secondary cord (on subsutural ramp)
P1 :	Shoulder cord
P2-P6 :	Primary cords of the convex part of the teleoconch whorl
s1-s6 :	secondary cords of the convex part of the teleoconch whorl
example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.	
ADP :	adapertural primary cord on the siphonal canal
MP :	median primary cord on the siphonal canal
ABP :	abapertural primary cord on the siphonal canal
EAB :	extreme abapertural primary cord on the siphonal canal
EAB1 :	extreme abapertural primary cord 1 on the siphonal canal

EAB2 :	extreme abapertural primary cord 2 on the siphonal canal
Example: EAB1 = between EAB and EAB2	
ads :	adapertural secondary cord on the siphonal canal
ms :	median secondary cord on the siphonal canal
abs :	abapertural secondary cord on the siphonal canal
eabs :	extreme abapertural secondary cord on the siphonal canal
eabs1 :	extreme abapertural secondary cord 1 on the siphonal canal
eabs2 :	extreme abapertural secondary cord 2 on the siphonal canal
Example: eabs1 = secondary cord between EAB and EAB1	
APERTURE	
ID:	Infrasutural denticle
D1 to D6:	Abapical denticles

Terminology in parentheses: erratic feature.

Table 1. Terminology used to describe the spiral cords (based on Merle, 1999 and 2001)

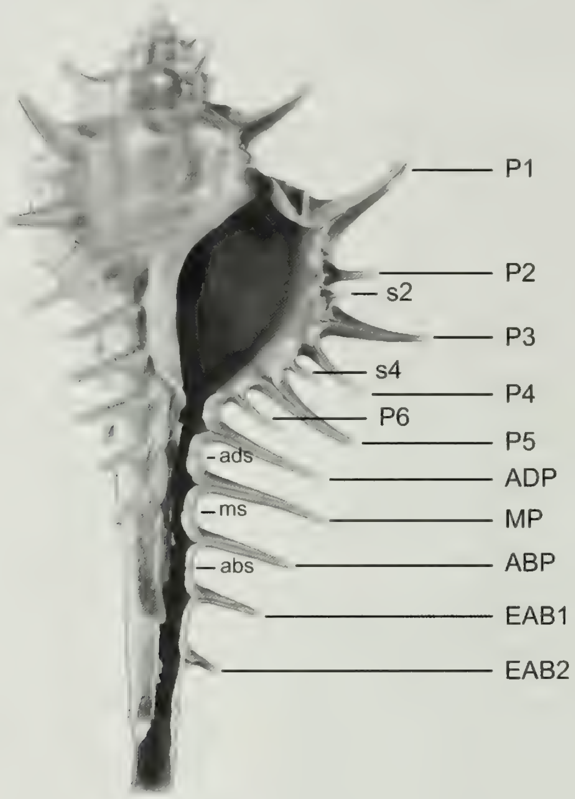


Fig. 1. Terminology used in *Murex (Murex) spinastreptos* n.sp.

Figures 2-16 (Protoconch: scale bar 0.5 mm)

2-7. *Murex (Murex) spinastreptos* n.sp.

2-3. Moluccas, from fishermen, 20-40 m, holotype IRSNB 31.468/MT2204, 59.5 mm; **4-5.** Arafura Sea, from fishermen, 15-25 m, paratype RH, 60.7 mm; **6-7.** Arafura Sea, from fishermen, 15-25 m, paratype MNHN 22715, 53 mm.

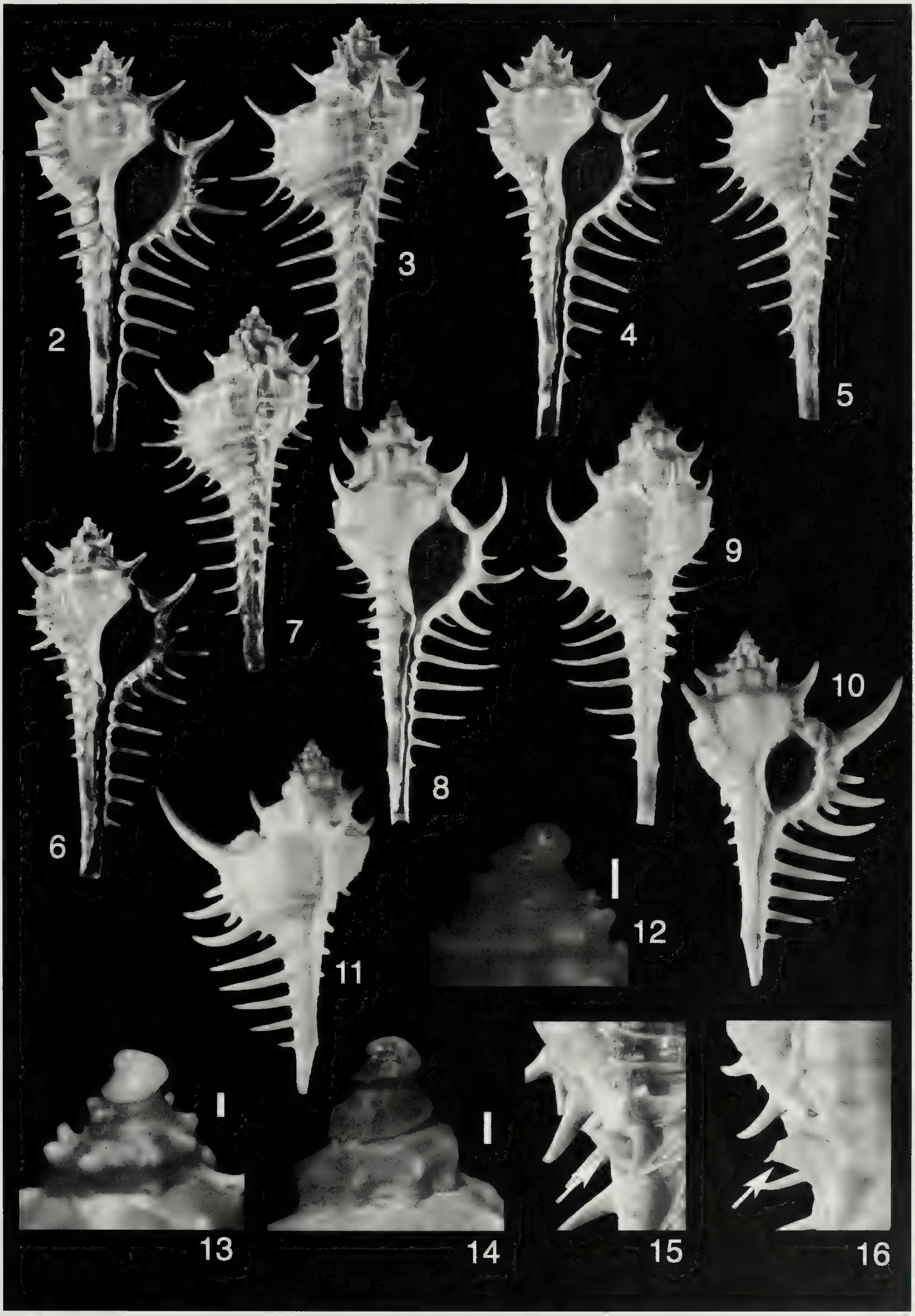
8-9. *Murex (Murex) occa* Sowerby, 1834, Thailand, Satul, crab nets, 5-10 m, in muddy sand, RH, 60.8 mm.

10-11. *Murex (Murex) coppingeri* Smith, 1884, Darwin, Northern Territory, Australia, RH, 54.3 mm.

12. Protoconch of *Murex (Murex) spinastreptos* n.sp.

12. Paratype RH; **13.** Paratype MNHN.

14. Protoconch of *Murex (Murex) occa* Sowerby, 1834 (specimen figured here); **15.** Labral tooth of *Murex (Murex) spinastreptos* n.sp.; **16.** Labral tooth of *Murex (Murex) occa* Sowerby, 1834


2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

SYSTEMATICS

Family **MURICIDAE** Rafinesque, 1815
Subfamily **MURICINAE** Rafinesque, 1815
Genus ***Murex*** Linnaeus, 1758
Subgenus *Murex* s.s.
Type species by subsequent designation (Montfort, 1810): *Murex tribulus* Linnaeus, 1758, as *Murex pecten* Montfort, 1810 (not Lightfoot, 1786), Recent, Indo-West Pacific.

Murex (Murex) spinastreptos n.sp.

Figs 1, 2-7, 12-13, 15

Type material. Moluccas, 20-40 m, by fishermen, 59.5 mm, holotype IRSNB IG 31.468/MT2204; Arafura Sea, 15-25 m, by fishermen, 53.0 mm paratype MNHN 22715: 60.7 mm, paratype RH (all live taken).

Type locality. Indonesia, Moluccas, 20-40 m.

Distribution. Arafura Sea and Moluccas, living at 15-20 m.

Description. Shell small for the genus, up to 60.7 mm in length. Lengh/width ratio: 1.92-2.14:1. Slender, spinose, weakly nodose, lightly built. Subsutural ramp weakly sloping, straight or weakly concave.

Shell light or dark greyish-tan with lighter coloured spiral cords and threads, light cream coloured nodes between axial varices and varical spines topped with light cream abaperturally, obviously extended on spiral cords of siphonal canal. Abapical extremity of siphonal canal darker coloured. Outer lip of aperture dark brown within, bordered with a glossy white band with small brown blotches between crenulations and on anal notch. Columellar lip bordered with white, light brown and white within.

Spire high with 2.15-2.5 protoconch whorls and teleoconch up to 5 broad, angulated, strongly shouldered spinose whorls. Suture weakly impressed. Protoconch large, broad, irregularly shaped, first whorl smooth, second and last whorls with a single strong narrow keel abapically. Terminal lip thin, low, oblique, weakly curved, almost straight.

Axial sculpture of teleoconch whorls consisting of low lamellate ribs, rounded varices and intervarical nodes: first whorl with 8 lamellate ribs, second with 8 lamellate ribs changing to varices and intervarical nodes at the end of whorl, third, fourth and last whorl with 3 spinose, low rounded varices and 2 narrow intervarical nodes between each pair of varices. Spiral cords of low smooth primary and secondary cords and few weak threads: first and second whorls with visible P1 and P2; third whorl with P1 and narrow P2; fourth whorl with adis, IP, abis, P1, s, P2; last whorl with adis, IP, abis, P1, s1, P2, s2, P3, P4, s4, P5, P6, (s6). Spiral cords extending as acute open spines on varices. P1, P3 and P5 longest spines of last whorl, P2 shortest, very tiny on previous whorls.

Aperture broad, ovate. Columellar lip narrow, smooth except knobs of ADP, MP and ABP in transparency. Rim very weakly erect abapically, otherwise adherent. Anal notch deep, broad. Outer lip erect, crenulate, with narrow weak labral tooth between P4 and s4 and low elongate denticles within, giving rise to short crenulations on outer lip: ID split, D1 split, D2, D3 (D4 to D6 obsolete). Siphonal canal long, broad, straight, open, with ADP, ads, MP, ms, ABP, abs, EAB1, (eabs1), EAB2, (eabs2), (EAB3). Primary cords giving rise to long or short, straight, abaperturally bent, spines: ADP and MP approximately similar in size, ABP, EAB1, EAB2, and EAB3 when present, decreasing in length abapically.

Operculum and radula unknown.

Remarks. *Murex (Murex) spinastreptos* n.sp. undoubtedly belongs to what is named the *Murex scolopax* group by Ponder & Vokes (1988: 49) and which now includes the following seven Recent species:

- *Murex scolopax* Dillwyn, 1817 from the southern part of the Red Sea, the Gulf of Aden and the Persian Gulf.
- *Murex occa* Sowerby, 1834 from Thailand, Malaysia, Sumatra and Java.
- *Murex acanthostephes* Watson, 1883 from Carnarvon (Western Australia) to the Torres Straits (Queensland, Australia).
- *Murex poppei* Houart, 1979 known from a small area between Thailand, Sumatra and Borneo.
- *Murex altispira* Ponder & Vokes, 1988 from Thailand and the Philippine Islands.
- *Murex somalicus* Parth, 1990 from Northern Somalia to Djibouti.
- *Murex megapex* Neubert, 1998 from the Gulf of Aden.

All these species have a few shell characters in common: a more or less smooth surface, few broad spines on the siphonal canal, more or less angulated teleoconch whorls, and a broad irregularly shaped protoconch of variable size, with a more or less strongly keeled last whorl, denoting a probable intracapsular larval development, corroborated by their restricted geographical distribution.

Murex (Murex) spinastreptos n.sp. differs from the most related closely species, namely *Murex occa* (Figs 8-9, 14 and 16), in having comparatively broader teleoconch whorls, weakly broader, shorter and chiefly straighter varical spines, especially noticeable on the siphonal canal, *M. occa* having strongly upward curved shoulder spines and relatively long, curved spines on the siphonal canal. *M. (M.) spinastreptos* also has a relatively broader siphonal canal and a narrower labral tooth (Figs 15-16).

All the other species of this group differ in many other aspects, including length, width, and outline of the shell, teleoconch whorls, spines and labral teeth and do not need to be compared here.

Another species *M. (M.) coppingeri* Smith, 1884 (Figs 10-11), also occurring in the Arafura Sea, can be confused with *M. spinastreptos* n.sp. due to its small size, angulated teleoconch whorls and broad spines, however it is definitively different, having a conical protoconch of 3 smooth whorls, denoting a probable planktotrophic larval development. *M. coppingeri* also has longer, more curved and broader varical spines, a less prominent labral tooth and a siphonal canal with tapered adapical extremity.

Etymology. *Spina* (L): spine and *streptos* (G): straight. Named after the distinctive straight spines and the straight siphonal canal.

Murex (Murex) ternispina Lamarck, 1822

Figs 17, 19-21, 24-26

Murex ternispina Lamarck, 1822: 158.
Murex nigrospinosus Reeve, 1845: pl. 20, fig. 79.
Murex ternispina Ponder & Vokes, 1988: 80, Figs 41-43, 77J, 86 C (only); Table 31.

Distribution: From Sri Lanka to Southeast Asia, south of Japan and throughout Indonesia.

Diagnosis. Shell up to 117 mm in length with an average size of 70-90 mm, with 2-2.25 protoconch whorls and 6 or 7 teleoconch whorls. Protoconch small, whorls rounded, last whorl with narrow keel abapically, otherwise smooth, glossy.

Siphonal canal long, broad, straight, open, with 5-7 acute, long spines.

Colour creamy-white, light tan or light brown, tip of primary spines usually tinged with purple. Aperture white.

Remarks. *Murex ternispina* is easily distinguishable from other species of *Murex* s.s. by its very nodulose shell sculpture, broad and straight spines on teleoconch whorls, and usually dark purple coloured tip of primary spines, in the absence of spinelets on the siphonal canal, and in its concentrically foliate operculum with subcentral nucleus.

The specimen illustrated by Ponder & Vokes (1988: Fig. 86B only) from the Solomon Islands turned out to be another species, named later *Murex salomonensis* Parth, 1994 (Figs 18, 22-23). *Murex salomonensis* is related to *M. ternispina* Lamarck, 1822, although the shell of *M. salomonensis* has weaker axial sculpture and a different protoconch (see Figs 17 and 18). Moreover, the dark purple tinge on the primary spines is situated approximately in the middle of each spine in *M. salomonensis*, while it is situated at the tip of the spines in *M. ternispina*.

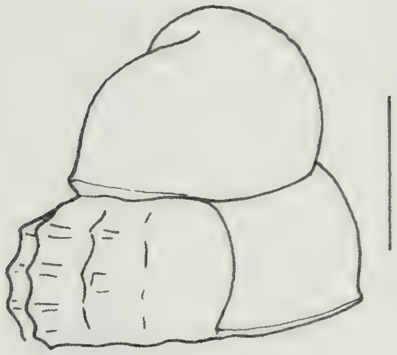


Fig. 17. *Murex ternispina*, protoconch, Philippines. Scale 0.5 mm.

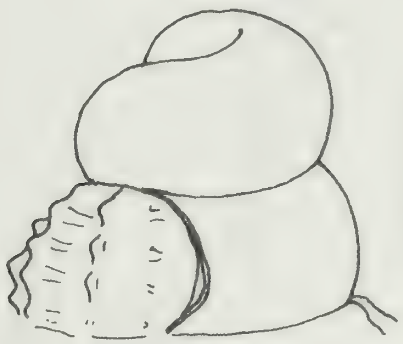


Fig. 18. *Murex salomonensis*, protoconch, Papua New Guinea. Scale 0.5 mm.

A beautiful colour form of *M. ternispina* with very dark coloured varices and spines, from Kangean Islands, off east Java (Figs 24-26), was sent to me for identification. Unfortunately the protoconch was eroded in the 3 specimens examined but all other shell morphology characters conform with the typical form.

ACKNOWLEDGEMENTS

I am grateful to Rajiwan Tirtadinata, Jakarta, Indonesia for giving me the opportunity to examine his specimens of *Murex ternispina* from Java and to John Wolff, Lancaster, Pennsylvania, U.S.A, for checking the English text.

REFERENCES

Bouchet, P. & Bail, P. 1991. Volutes from Saya de Malha Bank: the saga of *Lyria surinamensis* and a new species. *Nautilus* 105(4): 159-164.

Houart, R. 1992. The genus *Chicoreus* and related genera (Gastropoda: Muricidae) in the Indo-West Pacific. *Mémoires du Muséum national d'Histoire naturelle*. Zoologie, Tome(A), 154: 1-188.

Houart, R. 1999. Review of the Indo-West Pacific species of *Haustellum* Schumacher, 1817 and comments on *Vokesimurex* Petuch, 1994 (Gastropoda : Muricidae) with the description of *H. bondarevi* n.sp. *Apex* 14(3-4): 81-107.

Lamarck, J.B.P.A., de M. de, 1822. *Histoire naturelle des animaux sans vertèbres*, vol. 7, Paris: 1-232.

Merle, D. 1999. *La radiation des Muricidae (Gastropoda : Neogastropoda) au Paléogène: approche phylogénétique et évolutive.* Paris. Unpublished thesis, Muséum national d'Histoire naturelle : i-vi, 499 pp.

Merle, D. 2001. The spiral cords and the internal denticles of the outer lip in the Muricidae: terminology and methodological comments. *Novapex* 2 (3): 69-91.

Okutani, T. 1991. Mistaken localities for some shells "from Surinam". *The Nautilus* 105(4): 165.

Parth, M. 1990. A new muricid species from Somalia. *La Conchiglia* 22(256): 40-42.

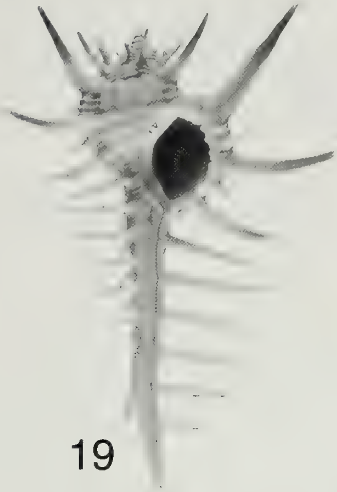
Ponder W.F. & Vokes E.H. 1988. Revision of the Indo-West Pacific fossil and Recent species of *Murex* s.s. and *Haustellum* (Mollusca: Gastropoda: Muricidae). *Records of the Australian Museum*, suppl. 8: 1-160.

Radwin G. & D'Attilio, A. 1976. *Murex* shells of the world. An illustrated guide to the Muricidae. Stanford University Press, Stanford: 1-284.

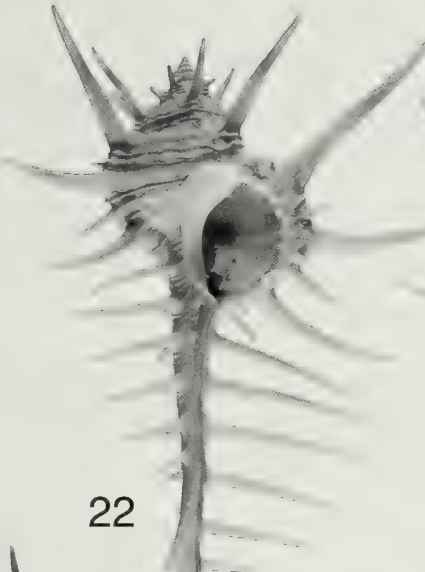
Reeve, L.A., 1845. *Conchologia iconica, or illustrations of the shells of molluscous animals. Monograph of the genus Murex*. L. Reeve, London, vol.3: pls. 1-36.

Figures 19-26

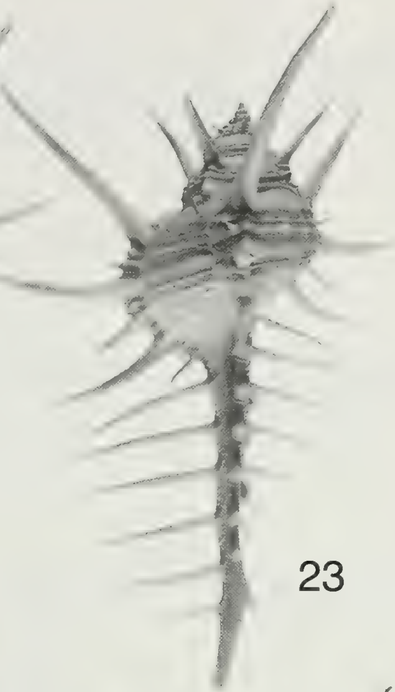
19-21. *Murex (Murex) ternispina* Lamarck, 1822, Cebu, Philippines, RH (19-20. 71 mm; 21. 72 mm);
22-23. *Murex (Murex) salomonensis* Parth, 1994, Madang, Papua New Guinea, 40-60 m, RH, 86.2 mm;
24-26. *Murex (Murex) ternispina* Lamarck, 1822, Kangean Islands, about 60 km northern side of E Java, 10-20 m, sandy bottom, coll. T. Tirtadinata (24. 104.5 mm; 25-26. 79.7 mm).



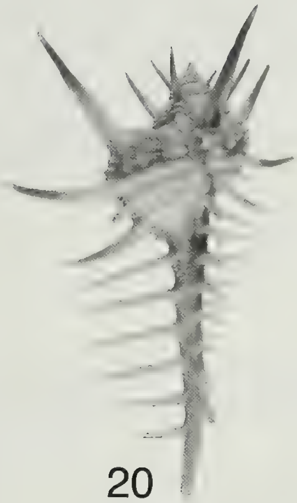
19



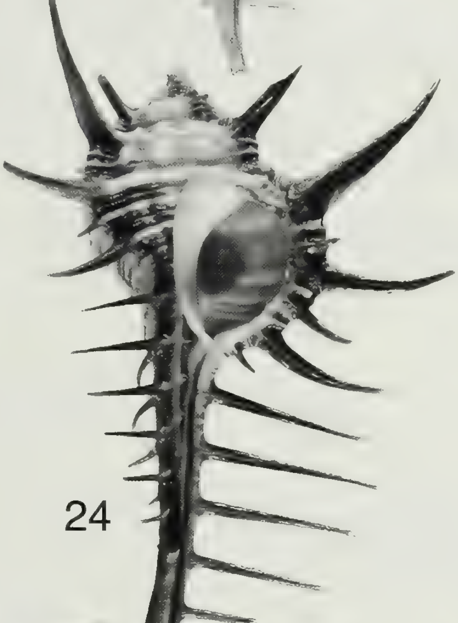
22



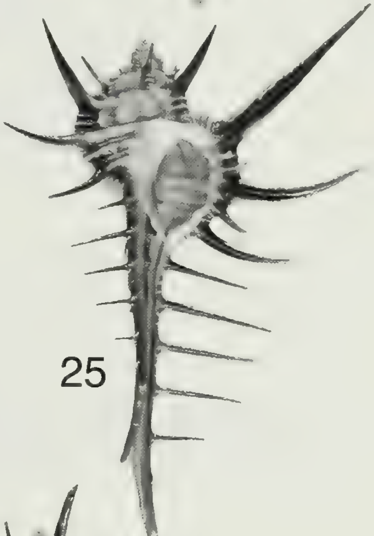
23



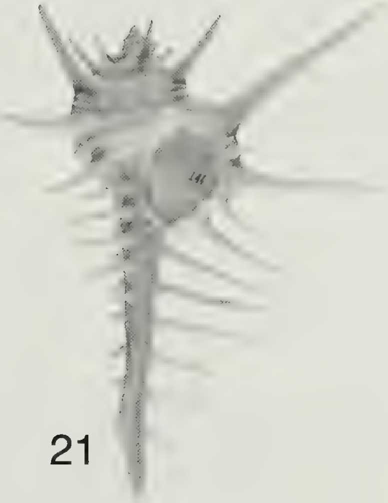
20



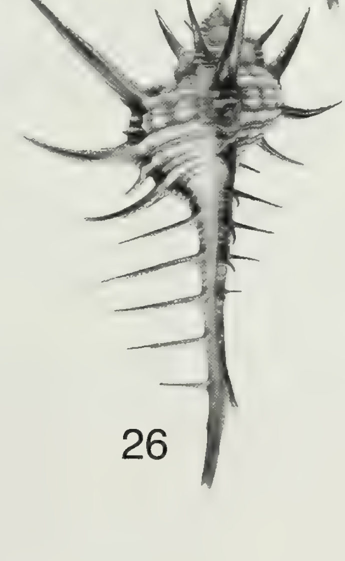
24



25



21



26

NOTE AUX AUTEURS

Conditions Générales. L'affiliation à la Société n'est pas obligatoire pour les auteurs. La publication des articles de maximum 12 pages imprimées en double interligne est gratuite. Au-delà de 12 par numéro, chaque page sera facturée au prix de 40,00 €. Les articles de taille supérieure peuvent être scindés sur plusieurs numéros.

Les numéros hors série sont publiés irrégulièrement. Les auteurs désireux de soumettre un article pour un numéro hors série (40 pages imprimées ou plus) sont priés de contacter auparavant la Société Belge de Malacologie à l'adresse ci-dessous.

Les articles décrivant de nouvelles espèces (sous-espèces) ne seront acceptés que si le matériel type primaire est déposé dans un Musée ou une Institution scientifique publique.

Les auteurs devront suivre strictement les règles du *Code de Nomenclature Zoologique* (quatrième édition).

Manuscrits. Les manuscrits seront rédigés en français ou en anglais. Ils doivent être dactylographiés, justifiés à gauche, avec double interligne, sur une seule face de papier A4 et sur une colonne. Les marges doivent être de 25 mm minimum. La séquence des sections respectera l'ordre suivant : titre, nom de(s) auteur(s), adresse(s) de(s) auteur(s), mots-clés et résumé en anglais (et éventuellement en français). Les noms de genre et des (sous) espèces seront en caractères *italiques*. Les références dans le texte auront la forme: Keen & Campbell (1964) ou (Keen & Campbell, 1964). **Consultez un numéro récent de Novapex pour l'organisation du texte.**

La liste des références, en ordre alphabétique, respectera la forme suivante (les titres des publications ne devraient pas être abrégés):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *The Veliger* 7(l): 46-57.

Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells*. William Collins Publishers Ltd: xiv + 500 pp.

Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.

Source Internet:

Auteur(s) 2007. Titre du site web ou de la base de données, nom de l'éditeur et localité (si indiquée), nombre de pages, adresse: http://www.... (date d'accès).

Illustrations. Les photographies doivent être de bonne qualité (couleur ou noir/blanc), imprimées sur papier brillant et montées sur un support adéquat dans le format final souhaité (max. 16 X 21 cm). Des photographies en couleur peuvent être soumises pour une reproduction en noir et blanc. Les illustrations peuvent également être fournies sur un support informatique (CD-ROM, ZIP) en format PSD (Photoshop) BMP, JPG ou TIFF avec mention du programme utilisé. Elle doivent être montées et ne peuvent contenir aucun texte, sauf la numérotation. Une version imprimée des planches doit être impérativement jointe au manuscrit.

Si plus d'une figure apparaît sur une planche ou/et dans le texte, TOUTES les figures doivent être numérotées consécutivement (Fig. 1, 2, 3...) ET PAS Fig 1A, 1B, 1C, NI planche 1, Fig. 1...

L'inclusion de planches couleurs est soumise à l'approbation du conseil d'administration qui prendra la décision finale. Les auteurs désireux d'inclure une ou plusieurs planches couleurs sont priés de se renseigner quant aux possibilités offertes et aux coûts.

Traitement des manuscrits. Les manuscrits seront soumis au conseil d'administration qui distinguera les articles d'intérêt scientifique et ceux d'intérêt général. Les décisions et les commentaires seront communiqués aux auteurs, qui en tiendront compte. La version corrigée devra être renvoyée à la Société Belge de Malacologie sous forme informatisée (en Word pour Windows) accompagnée d'un tirage sur papier. Elle devra respecter strictement les instructions de mise en page qui auront été communiquées aux auteurs. Une épreuve finale sera renvoyée aux auteurs pour correction.

Tirés-à-part. En ce qui concerne les articles d'intérêt scientifique, 30 exemplaires sont gratuits, jusqu'à concurrence de 240 pages maximum, si au moins un des auteurs est membre de la Société. Les exemplaires supplémentaires (min. 30 exemplaires) seront facturés au prix coûtant.

Pour les non-membres, les tirés à part sont à charge des auteurs, au prix coûtant (minimum 30 exemplaires). Les frais de port sont toujours à charge des auteurs.

Les manuscrits, les épreuves corrigées et toute correspondance seront adressés à:
Société Belge de Malacologie, M. R. Houart, B.P. 3, B-1370 Jodoigne, Belgique.

NOTE TO AUTHORS

General conditions. Membership is not mandatory for authors. Publication of papers with a maximum of 12 double spaced printed pages is free of charge. Beyond 12, every page will be invoiced at the price of 40,00 €. Larger papers may be splitted on several issues.

Supplements are published irregularly. Authors wishing to submit papers for supplements (40 printed pages or more) are asked to contact the board previously at the address mentioned below.

Papers describing new species (subspecies) will be accepted only if the primary types are deposited in a recognized public Museum or scientific Institution.

The paper will be in accordance with the rules of the *International Code of Zoological Nomenclature* (Fourth edition)

Manuscripts. Manuscripts will be in English or in French. They must be typed on one column, ragged right (left-justified), double-spaced throughout, on one side only of A4. Margins must be at least 25 mm. The sequence of sections will respect the following order: title, name of author(s), address(es) of author(s), keywords and summary in English. Generic and (sub)specific names have to be typed in *italics*. References in the text should be given as follows: Keen & Campbell (1964) or (Keen & Campbell, 1964). **Refer to a recent issue of Novapex for the lay out.**

References, in alphabetic order, should be given in the following form (titles of journals should not be abbreviated):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.

Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells*. William Collins Publishers Ltd: xiv + 500 pp.

Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.

Internet resources.

Author(s) 2007. Title of the website or database, publisher name and locatiuon (if indicated), number of pages, address: http://www.... (date of access).

Illustrations. Photographs must be of a high quality (colour or black/white), printed on glossy paper in a final version (max. 16 X 21 cm), adequatly mounted. Colour work can be submitted for black & white production. The illustrations may be submitted as digital files (CD-ROM, ZIP) in BMP, JPG or TIFF format, with mention of the program. They must be adequately mounted with not any other text than the numbering. A printed version of the plates must be imperatively sent together with the manuscript.

If more than one figure is included in a plate or/and in the text, ALL figures must be consecutively numbered (Fig. 1, 2, 3...) NOT Fig 1A, 1B, 1C, NOR plate 1, Fig. 1...

Inclusion of colour plates has to be approved by the board who will take the final decision. Authors who want to include colour plates are invited to ask for possibilities and charges.

Processing of manuscripts. Manuscripts will be submitted to the board who will distinguish between the articles of scientific interest, and those of general aim. The comments will be communicated to authors, who will consider them. A diskette containing the corrected version should be sent back to the Belgian Malacological Society (in Word for Windows support) together with a printed copy. It should strictly follow the style instructions which will be communicated to the author(s).

Reprints. With regard to papers of scientific interest, 30 reprints are free of charge, representing a maximum of 240 pages, if at least one author is member of the Society. Additional copies (at least 30) will be invoiced at cost.

For non-members, the reprints (min. order 30 copies) will be billed to the author(s). Mailing costs are always to be paid by authors.

Manuscripts, corrected proofs and any mail are to be sent to:
Société Belge de Malacologie, Mr. R. Houart, B.P. 3, B-1370 Jodoigne, Belgium.

C. Delongueville & R. Scaillet — Importante population de *Siphonaria crenata* Blainville, 1827 implantée à l'ouest du golfe d'Iskenderun (Turquie) — 8

J.-P.Coppée — Etymologie et malacologie dans deux sites naturels du nord-est de Bruxelles – Deuxième partie — 12

E.Meuleman — L'écho des réunions :
- Roland Scaillet & Christiane Delongueville : Les Iles Kerkennah (Tunisie) — 21

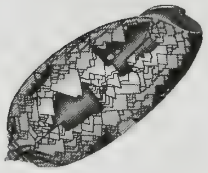
C. Vilvens — La Bourse d'Anvers de la BVC les 15 et 16 mai 2010 — 22

R. Scaillet, C. Vilvens & R.Houart — Quelques nouvelles publications — 23

C. Vilvens — Nous avons reçu — 27

C. Delongueville & R. Scaillet — Les marées de 2010 — 44

VIE DE LA SOCIETE LIFE OF THE SOCIETY



Prochaines activités de la SBM

Claude VILVENS

Lieu de réunion : **Nouveau local !**

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

- à partir de 14h.

SAMEDI 27 MARS 2010

C. Vilvens : Les Solariellidae : panorama général et perspectives

Parmi les anciens Trochidae, dont la classification a été profondément restructurée, les espèces du genre *Solariella* et autres *Archiminolia*, *Microgaza*, *Bathymophila*, *Zetela*, etc constituent encore à l'heure actuelle un large sujet de recherches. Cet exposé visera à brosser une vue d'ensemble de cette famille avec ses principaux genres et espèces emblématiques.

***

SAMEDI 25 AVRIL 2010

E. Meuleman : Les espèces invasives

Le phénomène des espèces invasives prend de plus en plus d'ampleur de part le monde. En particulier, les espèces des régions chaudes remontent à présent vers les zones tempérées, souvent au détriment de la faune locale. C'est à un panorama général de ce problème (déjà évoqué pour des zones particulières par certains de nos membres) qu'Etienne nous convie ici.

***

SAMEDI 29 mai 2010

Tout le monde : L'excursion de printemps de la SBM.

Avec le beau temps revient l'envie d'aller sur le terrain ;-) Comme toujours, nous ne savons encore précisément où se déroulera cette excursion car nous (Etienne et Claude) prospectons pour trouver les zones les plus favorables ou les moins investiguées jusqu'à présent. il est cependant probable que cela se passera dans le Hainaut.

Comme d'habitude, les informations sont disponibles sur notre site Internet (http://users.swing.be/sw216502/) ou auprès de Claude (vilvens.claude@skynet.be ou 04/248.32.25) et Etienne Meuleman (e.meuleman@skynet.be ou 04/380.55.16). Comme d'habitude aussi, il convient de prévoir d'emporter sa bonne humeur, un guide de détermination … et sans doute aussi bottes et vêtements de pluie (en principe, il fera magnifique, mais bon ;-) …).

***

SAMEDI 19 JUIN 2010

R. Houart : Les Muricidae – the continuing story

Notre spécialiste de cette splendide et épineuse famille nous invite à le suivre dans les méandres de la systématique de la sous-famille des Muricopsinae avec la suite attendue : *Murexiella* et Pygmaepterys. Belles coquilles et explications claires garanties !

Réservez déjà dans vos agendas le 11/9/2010 (reprise de contact).

Pour les informations de dernière minute :

http://users.swing.be/sw216502/ ou http://www.sbm.be.tf

Novapex/Société : la publication généraliste de la SBM

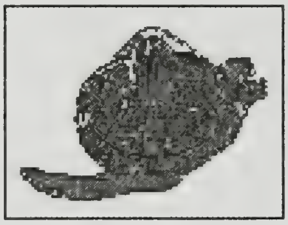
Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

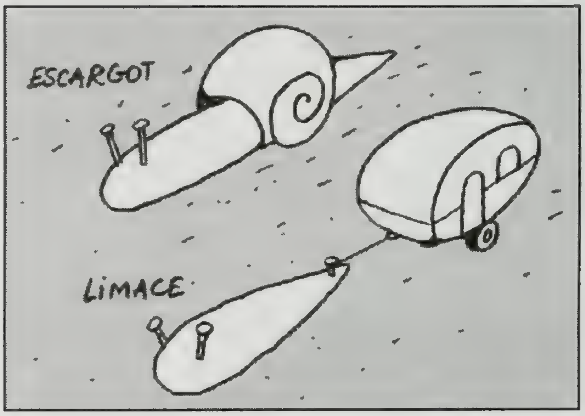
Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

Afin de faciliter le travail de la Rédaction, il est vivement (et le mot est faible ;-)) souhaité de respecter les règles suivantes pour les articles proposés :

- document MS-Word (pour PC Windows 2000 ou XP);
- police de caractères Times New Roman;
- texte de taille 10, titres de taille 12;
- interligne simple;
- toutes les marges à 2,5 cm;
- document en une seule section;
- pas de mode colonne;
- photos en version électronique JPG.

Merci pour les Scribes ;-) ! N'hésitez pas à demander une page avec en-tête pour cadrer au mieux vos travaux (vilvens.claude@skynet.be ou e.meuleman@skynet.be).





Malacologie basique ☺ de Philippe Geluck : "Le chat à Malibu", Ed. Casterman,

Echantillonnage de mollusques invasifs et première signalisation de *Chama aspersa* Reeve, 1846 à Chypre Nord

Christiane DELONGUEVILLE
Avenue Den Doorn, 5 – B - 1180 Bruxelles - christiane.delongueville@skynet.be

Roland SCAILLET
Avenue Franz Guillaume, 63 – B - 1140 Bruxelles - scaillet.roland@skynet.be

MOTS-CLEFS Chypre Nord, Chamidae, *Chama aspersa*, Mollusques invasifs

KEY-WORDS North Cyprus, Chamidae, *Chama aspersa*, Invasive molluscs

RÉSUMÉ

Différentes localités côtières de Chypre Nord ont été échantillonnées à la recherche de mollusques marins. Au sein des espèces trouvées, 16 sont invasives pour ces eaux de la Méditerranée et parmi elles figure, *Chama aspersa* Reeve, 1846. Après avoir été rapporté sur les côtes d'Israël, de Turquie et de Grèce, *Chama aspersa* est maintenant signalé pour la première fois le long de la côte Est de Chypre Nord.

ABSTRACT

Different localities along the coast of North Cyprus have been sampled in search for marine molluscs. In these Mediterranean waters, sixteen immigrant species have been found including *Chama aspersa* Reeve, 1846. After having been reported from the coasts of Israel, Turkey and Greece, *Chama aspersa* is now recorded for the first time from the Eastern coast of North Cyprus.

INTRODUCTION

Différentes publications font mention de la présence d'espèces invasives à Chypre Nord (Cecalupo & Quadri 1996 - Zenetos *et al.* 2009). A ce jour, pour ce qui concerne l'île dans son entièreté, 31 espèces de gastéropodes et 11 espèces de bivalves ont été répertoriées le long des côtes du territoire (Katsanevakis *et al.* 2009).

RÉCOLTES PERSONNELLES

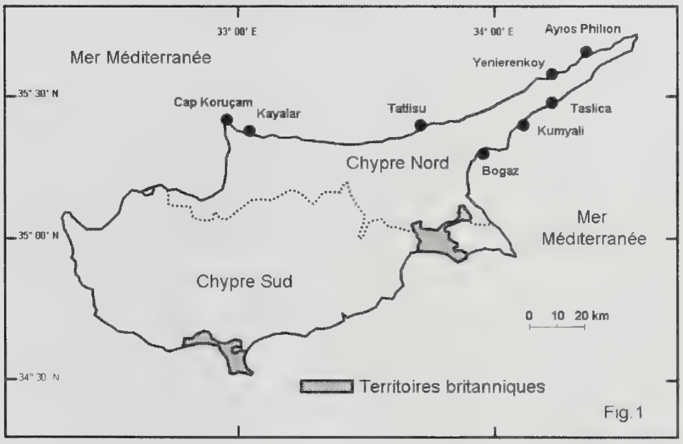


Fig. 1

La plage de Taslica se situe sur la côte Est de la péninsule de Karpaz à Chypre Nord. Elle se compose d'un long croissant de sable encadré par deux avancées composées d'un plateau rocheux s'enfonçant en pente douce dans la mer avant de plonger vers un fond sableux. En bordure de ce plateau, là où viennent mourir les vagues, de petits bassins de pierre concentrent sable grossier, petits cailloux et coquilles mortes. Parmi celles-ci, sept espèces invasives ont été répertoriées dont un spécimen de *Chama aspersa* Reeve, 1846 (25,1 x 20,8 mm) (Fig. 4 et 23).

Sept autres stations ont fait l'objet d'échantillonnage en 2007 et 2009 (Fig. 1). Ces récoltes ont révélé, en tout, la présence de seize espèces de mollusques invasifs (Tableau 1). Les premiers envahisseurs, présents en Méditerranée depuis plusieurs décennies, sont définitivement bien implantés et trouvés en abondance tout le long des côtes: *Cerithium scabridum* Philippi, 1848 (Fig. 3), *Strombus persicus* Swainson, 1821 (Fig. 15) et *Brachidontes pharaonis* (Fischer P., 1870) (Fig. 2). *Ergalatax junionae* Houart, 2008 (Fig. 8), d'introduction plus récente (Delongueville & Scaillet 2008), semble imposer sa présence dans la quasi-totalité des stations et réussit une implantation sans cesse croissante. Cette tendance semble également se confirmer pour *Chama pacifica* Broderip, 1834 (Fig. 6). L'aplysie, *Aplysia dactylomela* Rang, 1828 (Fig. 16), observée en 2007 dans un « rock pool » à Kayalar, n'a pas été retrouvée lors de la campagne de recherche 2009.

Tableau 1.

V = vivant E = vide	Ayios Phillion	Bogaz	Cap Koruçam	Kayalar	Kumyali	Taslica	Tatlisu	Yenierenkoy	Illustrations
Mytildae									
Brachidontes pharaonis (Fischer P., 1870)	V	V	V	V			V		Fig. 2
Septifer forskali Dunker, 1855			E						Fig. 9
Pteriidae									
Pinctada radiata (Leach, 1814)	V					E	E		Fig. 17
Malleidae									
Malvufundus regula (Forskål, 1775)				E			E		Fig. 11
Ostreidae									
Dendrostrea frons (Linnaeus, 1758)						E	V		Fig. 12
Chamidae									
Chama aspersa Reeve, 1846						E			Fig. 4
Chama pacifica Broderip, 1834	V			E			V		Fig. 6
Cerithiidae									
Cerithium scabridum Philippi, 1848	V	V	E	E		E	E		Fig. 3
Rhinoclavis kochi (Philippi, 1848)						E			Fig. 5
Cerithiopsisdae									
Cerithiopsis pulvis (Issel, 1869)			E						Fig. 13
Strombidae									
Strombus persicus Swainson, 1821			E	E	V	E	E	V	Fig. 15
Muricidae									
Ergalatax junionae Houart, 2008	V	V	E	V	E	E	V		Fig. 8
Pyramidellidae									
Cingulina isseli (Tryon, 1886)			E						Fig. 10
Retusidae									
Cylichnina girardi (Audouin, 1826)			E						Fig. 14
Cylichnidae									
Acteocina mucronata (Philippi, 1849)			E						Fig. 7
Aplysiidae									
Aplysia dactylomela Rang, 1828				V					Fig. 16

DISCUSSION

Chama aspersa : origines multiples des populations méditerranéennes

Chama aspersa Reeve, 1846, Chamidae originaire de l'Indo-Pacifique est un des nombreux envahisseurs installé le long des côtes de la Méditerranée orientale. Signalée d'abord sur la côte d'Israël (récoltes en 2002 et 2004 : Mienis 2004 et 2006), la présence de ce bivalve a été décrite le long des côtes méridionales de la Turquie à Marmaris (sud-est de la mer Egée) et à Mersin (Méditerranée orientale) (Mifsud & Ovalis 2007) et dans le golfe d'Evoikos (entre l'Attique et l'Eubée) (récoltes en 2007 : Ovalis & Zenetos 2007). Avant la première publication localisant *Chama aspersa* en Israël, l'espèce était déjà présente dans le bassin levantin comme en témoignent des spécimens récoltés en 1993 à Liman Kalesi (Turquie) (Fig. 19), en 2002 à Yumurtalik (Turquie) (Fig. 20 et 21) et en 2005 à Karatas (Turquie) (Fig. 22) (Collection Delongueville & Scaillet). En outre, un spécimen récolté en 1990 sur une ancre à Silivri (Mer de Marmara, non loin d'Istanbul - collection Delongueville & Scaillet) (Fig. 18), date bien antérieure à celle de la première signalisation officielle en Méditerranée, laisse supposer l'existence de plusieurs phases d'introduction de l'espèce, indépendantes les unes des autres. Ceci peut s'expliquer une fois de plus par un apport anthropique lié aux vidanges de ballasts des navires dans des zones maritimes très fréquentées, ce qui est le cas de l'embouchure du Bosphore à Istanbul et du golfe d'Iskenderun à l'Est de la Turquie. La taille de ces spécimens ne dépasse pas 1,5 à 2,5 cm. L'espèce est aisément reconnaissable par sa couleur spécifique: la valve droite (opposée à celle attachée au substrat) est de couleur crème et ornée de deux à trois bandes brunes se réunissant dans la région de l'umbo (Rusmore - Villaume 2008).

CONCLUSIONS

L'expansion des mollusques invasifs en Méditerranée orientale et à Chypre Nord en particulier est un phénomène qui prend une ampleur sans cesse croissante. Les échantillonnages systématiques apportent à chaque fois leur lot d'espèces additionnelles non encore répertoriées. *Chama aspersa* Reeve, 1846 est signalé pour la première fois sur la côte Est de Chypre Nord et pourrait avoir envahi la Méditerranée et la mer de Marmara en plusieurs phases indépendantes les unes des autres.

REMERCIEMENTS

Nous remercions Argyro Zenetos (Hellenic Center for Marine Research - Institute of Oceanography - Anavissos - Grèce) pour ses commentaires utiles.

RÉFÉRENCES

Cecalupo, A. & Quadri, P., [1995] 1996. Contributo alla conoscenza malacologica per il Nord dell'Isola di Cipro (Terza e ultima parte). *Bolletino Malacologico*; 31(5-8):95-118.

Delongueville, C. & Scaillet, R., 2008. Colonisation des côtes de la République Turque de Chypre du Nord par un Muricidae originaire du golfe persique (*Ergalatax* Iredale, 1931). *Novapex/Société*; 9(1):3-6.

Katsanevakis, S., Tsiamis, K., Ioannou, G., Michailidis, N. & Zenetos, A. 2009. Inventory of Alien Marine Species of Cyprus. *Mediterranean Marine Science*; 10(2):109-133.

Mienis, H.K., 2004. Mariene mollusken uit het oostelijk deel van de Middelandsezee 19. - De eerste vondsten van *Chama aspersa* Reeve, 1846. *Spirula*; 337:34-35.

Mienis, H.K., 2006. Monitoring Invasion of the Eastern Mediterranean by Lessepsian Migrants and Other Indo-Pacific Molluscs. *Haasiania*; 3:67-68.

Mifsud, C. & Ovalis, P., 2007. *Chama aspersa* Reeve, 1846 (Bivalvia: Chamidae) Another Established Lessepsian Invader in the Mediterranean Sea. *Novapex*; 8(1):27-28.

Ovalis, P. & Zenetos, A., 2007. On the Establishment of Two More Alien Mollusca (*Chama aspersa* Reeve, 1846 and *Chama asperella* Lamarck, 1819) in the Eastern Mediterranean. *Mediterranean Marine Science*; 8(2):97-100.

Rusmore - Villaume, M.L., 2008. *Seashells of the Egyptian Red Sea.* The American University in Cairo Press - Cairo - Egypt; 307 p.

Zenetos, A., Konstantinou, F. & Konstantinou, G., 2009. Towards Homogenization of the Levantine Alien Biota: Additions to the Alien Molluscan Fauna along the Cypriot Coast. *Marine Biodiversity Records*; doi: 10.1017/S1755267209990832; Vol. 2; e 156; 7 p.

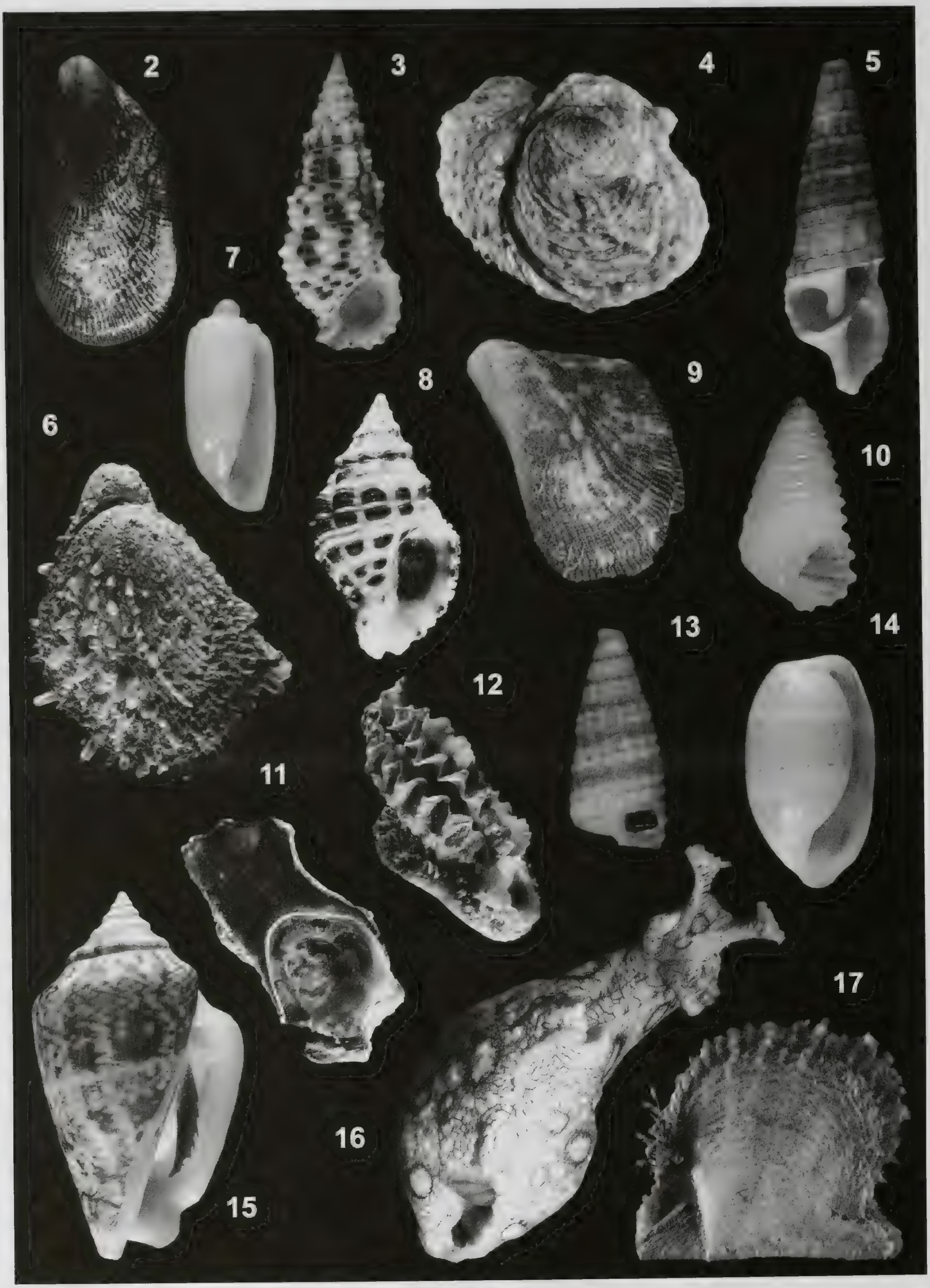
LÉGENDES

Fig. 1 Carte de Chypre Nord

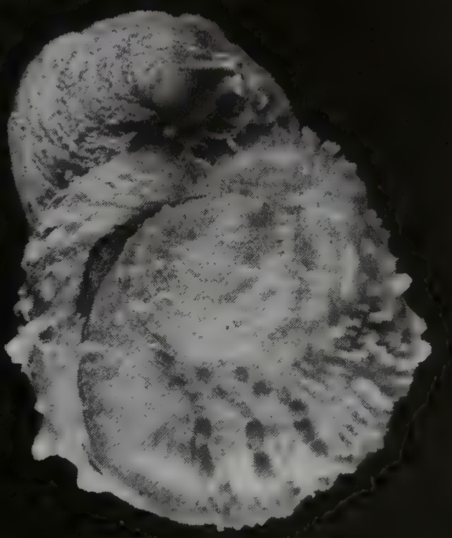
Planches

Fig. 2	*Brachidontes pharaonis* (Fischer P., 1870)	Cap Koruçam	23,6 x 11,6 mm.
Fig. 3	*Cerithium scabridum* Philippi, 1848	Ayios Philion	19,3 x 7,7 mm.
Fig. 4	*Chama aspersa* Reeve, 1846	Taslica	25,1 x 20,8 mm.
Fig. 5	*Rhinoclavis kochi* (Philippi, 1848)	Taslica	21,7 x 6,6 mm.
Fig. 6	*Chama pacifica* Broderip, 1834	Ayios Philion	48,6 x 37,9 mm.
Fig. 7	*Acteocina mucronata* (Philippi, 1849)	Cap Koruçam	2,3 x 1,1 mm.
Fig. 8	*Ergalatax junionae* Houart 2008	Bogaz	19,9 x 11,0 mm.
Fig. 9	*Septifer forskali* Dunker, 1855	Cap Koruçam	10,4 x 7,1 mm
Fig. 10	*Cingulina isseli* (Tryon, 1886)	Cap Koruçam	1,7 x 0.8 mm
Fig. 11	*Malvufundus regula* (Forskål, 1775)	Tatlisu	35,4 x 17,9 mm.
Fig. 12	*Dendrostrea frons* (Linnaeus, 1758)	Tatlisu	33,8 x 23,5 mm.
Fig. 13	*Cerithiopsis pulvis* (Issel, 1869)	Cap Koruçam	2,3 x 1,0 mm
Fig. 14	*Cylichnina girardi* (Audouin, 1826)	Cap Koruçam	3,4 x 2,0 mm.
Fig. 15	*Strombus persicus* Swainson, 1821	Yenierenkoy	52,6 x 29,6 mm.
Fig. 16	*Aplysia dactylomela* Rang, 1828	Kayalar	+/- 150 mm.
Fig. 17	*Pinctada radiata* (Leach, 1814)	Ayios Philion	42,3 x 38,3 mm.

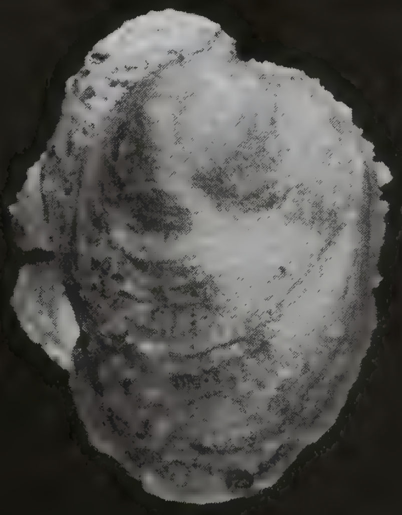
Fig. 18	*Chama aspersa* Reeve, 1846	Silivri (Turquie - Mer de Marmara)	16,2 x 17,3 mm
Fig. 19	*Chama aspersa* Reeve, 1846	Liman Kalesi (Turquie orientale)	23.0 x 15,9 mm.
Fig. 20	*Chama aspersa* Reeve, 1846	Yumurtalik (Turquie - Golfe d'Iskenderun)	17,2 x 12,3 mm.
Fig. 21	*Chama aspersa* Reeve, 1846	Yumurtalik (Turquie - Golfe d'Iskenderun)	12,6 x 13,7 mm.
Fig. 22	*Chama aspersa* Reeve, 1846	Karatas (Turquie - Golfe d'Iskenderun)	21,9 x 16,8 mm.
Fig. 23	*Chama aspersa* Reeve, 1846	Taslica (Chypre Nord)	25,1 x 20,8 mm.


2
3
4
5
7
6
8
9
10
13
14
12
11
17
16
15

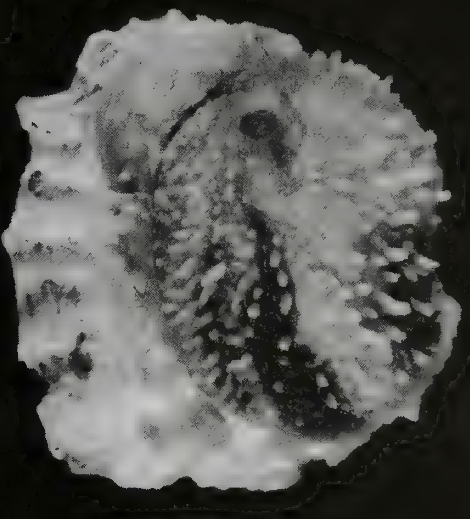
18



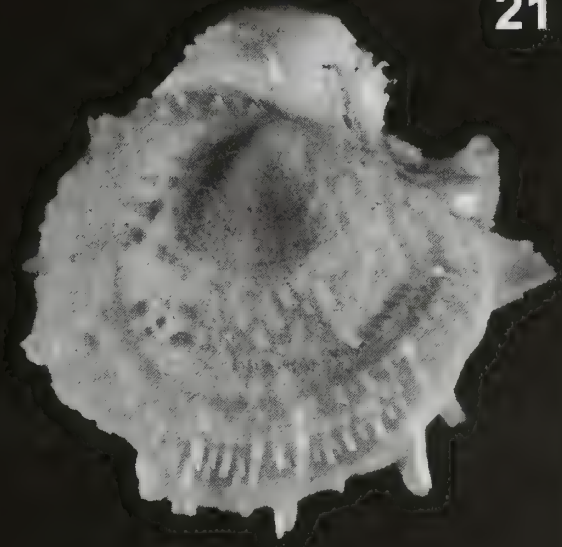
19



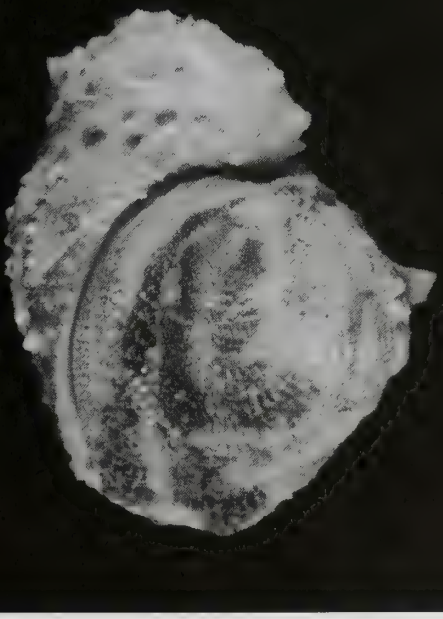
20



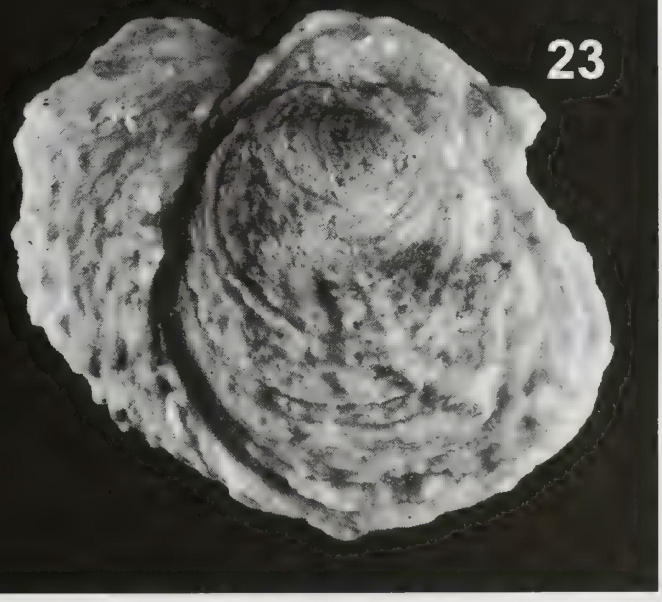
21



22



23



Importante population de *Siphonaria crenata* Blainville, 1827 implantée à l'ouest du golfe d'Iskenderun (Turquie)

Christiane DELONGUEVILLE
Avenue Den Doorn, 5 – B - 1180 Bruxelles - christiane.delongueville@skynet.be

Roland SCAILLET
Avenue Franz Guillaume, 63 – B - 1140 Bruxelles - scaillet.roland@skynet.be

MOTS-CLEFS Siphonariidae, *Siphonaria crenata*, Méditerranée, Mollusques invasifs

KEY-WORDS Siphonariidae, *Siphonaria crenata*, Mediterranean Sea, Invasive molluscs

RÉSUMÉ

Une importante population de *Siphonaria crenata* de Blainville, 1827 (Siphonariidae - Gastéropodes pulmonés marins) a été localisée le long des côtes rocheuses de Yumurtalik (ouest du golfe d'Iskenderun - Turquie).
Une autre espèce invasive appartenant à la même famille a été rapportée de la même région (*Siphonaria belcheri* Hanley, 1858). Un examen attentif des Siphonariidae présents dans le golfe d'Iskenderun devrait permettre de connaître l'extension réelle de ces deux espèces dans la région.

ABSTRACT

An important population of *Siphonaria crenata* de Blainville, 1827 (Siphonariidae - Marine pulmonate gastropods) was localized along the rocky shore of Yumurtalik (West of Iskenderun bay - Turkey).
Another invasive species from the same family was previously mentioned from this area (*Siphonaria belcheri* Hanley, 1858). A close examination of the Siphonariidae present in the Iskenderun Bay should contribute to the knowledge of the effective extension of these two species in the area.

INTRODUCTION

Le golfe d'Iskenderun est connu pour sa concentration importante en espèces invasives de mollusques marins (Çeviker 2001 - Çeviker 2002 - Albayrak & Çeviker 2001 - Zenetos *et al.* 2004). La situation géographique particulière du golfe et le trafic marin important dans la région sont deux facteurs qui contribuent à cet état de fait.

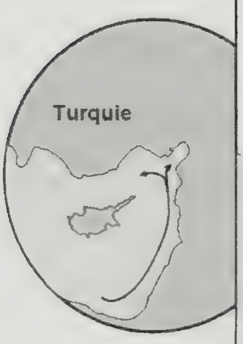


Fig. 1

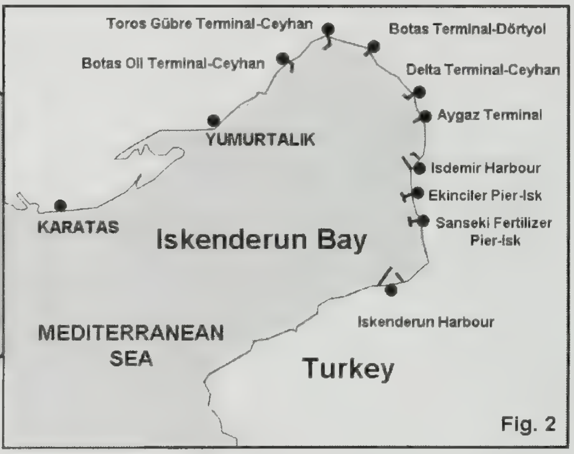


Fig. 2

Le golfe est une zone en cul de sac dans la partie orientale de la Méditerranée vers où confluent les courants marins provenant des côtes levantines situées plus au sud (Fig. 1). Les courants peuvent contribuer à la propagation de proche en proche d'espèces en provenance du canal de Suez.

La région est aussi au départ d'une voie maritime particulièrement fréquentée pour le transport des hydrocarbures. Les points mentionnés sur la figure 2 situent quelques terminaux d'accès des navires aux infrastructures pétrolières et industrielles de la zone. De nombreuses vidanges d'eaux de ballast doivent s'y produire, ce qui contribue, malgré certaines précautions prises (Gregg *et al.* 2009), à la dispersion de larves de mollusques ou de juvéniles provenant d'autres régions du globe. Pour peu que ces individus trouvent des conditions favorables à leur développement, des implantations d'espèces invasives peuvent ainsi voir le jour.

RÉCOLTES PERSONNELLES

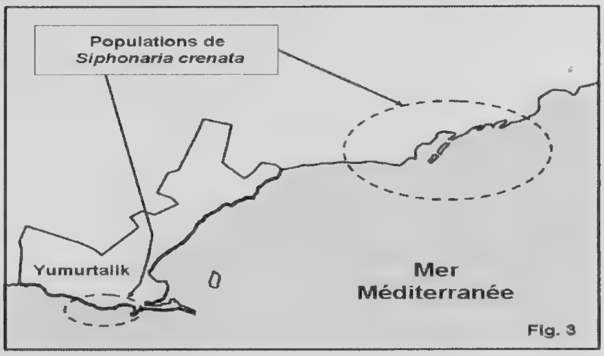


Fig. 3

Les côtes rocheuses aux alentours et dans le port de Yumurtalik (Fig. 3) abritent une importante colonie de *Siphonaria crenata* de Blainville, 1827.

Ce gastéropode pulmoné patelliforme (Fig. 5) affectionne les rochers dénudés situés à fleur d'eau (Fig. 4). Il cohabite sur ce milieu, tantôt à sec, tantôt recouvert, mais toujours humide, avec des balanes et des patelles (*Patella caerulea* Linnaeus, 1758) (Fig. 6). L'observation et la récolte de quelques spécimens ont été réalisées en fin du mois de septembre 2009.

DISCUSSION

Siphonaria crenata de Blainville, 1827 est connu de la mer Rouge et du canal de Suez (Dekker & Orlin 2000 - Rusmore-Villaume 2008). Des spécimens de Méditerranée ont été trouvés pour la première fois sur la côte israélienne en 1965 (Zenetos *et al* 2004). Une bonne iconographie est présente dans Barash & Danin 1992, qui mentionnent la présence de la coquille sous le nom de *Siphonaria kurracheensis* Reeve, 1856. Par la suite, une seconde espèce, originaire du Golfe Persique et non présente dans la mer Rouge ou le canal de Suez a été localisée dans le golfe d'Iskenderun : *Siphonaria belcheri* Hanley, 1858 (Albayrak & Çeviker 2001). Il s'agissait d'un spécimen mort récolté sur une plage à Burnaz.

Bien que dans l'atlas des espèces exotiques du CIESM (Zenetos *et al.* 2004) il soit suggéré une identification erronée (confusion avec *Siphonaria crenata*), Albayrak & Çağlar (2006) maintiennent l'identification originale de *Siphonaria belcheri* sur base de spécimens vivants récoltés en novembre 2005 sur une côte rocheuse à Iskenderun. Albayrak confirme ne jamais avoir trouvé dans le golfe d'Iskenderun de *Siphonaria* semblables à nos spécimens récoltés en 2009 (communication personnelle).

Si deux espèces coexistent dans le golfe d'Iskenderun, comme la présence récente de *Siphonaria crenata* identifiée à Yumurtalik semble l'indiquer (Fig. 7 à 10), leur introduction en Méditerranée est probablement le fruit de deux événements indépendants les uns des autres, liés une fois de plus à l'activité maritime intense que connait la région (vidange des eaux de ballast) ou aux possibles migrations en provenance des côtes d'Israël.

CONCLUSIONS

L'expansion des mollusques marins invasifs en Méditerranée orientale et dans le golfe d'Iskenderun en particulier est un phénomène qui prend une ampleur sans cesse croissante. Une population de *Siphonaria crenata* est fermement implantée dans la région de Yumurtalik où par ailleurs aucun spécimen de *Siphonaria belcheri* n'a pu être mis en évidence lors de la récolte de septembre 2009.

Un examen attentif des Siphonariidae présents dans le golfe d'Iskenderun devrait permettre de connaître l'extension réelle des populations de *Siphonaria crenata* et *Siphonaria belcheri* dans cette région.

NOTE

La nomenclature des mollusques est reprise de CLEMAM, "Check List of European Marine Mollusca" www.somali.asso.fr/clemam/index.clemam.html - consultation 15 janvier 2010.

REMERCIEMENTS

Nous remercions Argyro Zenetos (Hellenic Center for Marine Research - Institute of Oceanography - Anavissos - Grèce) et Serhat Albayrak (Department of Biology, Faculty of Sciences, University of Istanbul - Turquie) pour leurs commentaires éclairés.

RÉFÉRENCES

Albayrak, S. & Çeviker, D. 2001. Two New Extra-Mediterranean Molluscs from Southeast Turkey : *Siphonaria belcheri* Hanley, 1858 [Gastropoda: Siphonariidae] and *Septifer bilocularis* (Linnaeus, 1758) [Bivalvia: Mytilidae]. *Israel Journal of Zoology*; 47:297-298.

Albayrak, S. & Çağlar, S. 2006. On the Presence of *Siphonaria belcheri* Hanley, 1858 [Gastropoda: Siphonariidae] and *Septifer bilocularis* (Linnaeus, 1758) [Bivalvia : Mytilidae] in the Iskenderun Bay (SE Turkey). *Aquatic invasions*; 1(4):292-294.

Barash, A. & Danin, Z. 1992. *Fauna Palaestina - Mollusca I - Annotated List of Mediterranean Molluscs of Israel and Sinai.* The Israel Academy of Sciences and Humanities - Jerusalem - Israel; 405 p.

Çeviker, D. 2001. Recent Immigrant Bivalves in the Northeastern Mediterranean off Iskenderun. *La Conchiglia*; 298:39-46.

Çeviker, D. 2002. A new finding of *Septifer forskali* Dunker, 1855 (Bivalvia: Mytilidae) from the Northeastern Mediterranean Sea, Turkey. *La Conchiglia*; 305:14-16,59.

Çeviker, D. & Albayrak, S. 2006. Three Alien Molluscs from Iskenderun Bay (SE Turkey). *Aquatic invasions*; 1(2):76-79.

Dekker, H. & Orlin, Z. 2000. Check-List of Red Sea Mollusca. *Spirula*; 47 (Supplement):1-46.

Gregg, M., Rigby, G. & Hallegraeff, G.M. 2009. Review of Two Decades of Progress in the Development of Management Options for Reducing or Eradicating Phytoplankton, Zooplankton and Bacteria in Ship's Ballast Water. *Aquatic Invasions*; 4(3):521-565.

Rusmore-Villaume, M.L. 2008. *Seashells of the Egyptian Red Sea.* The American University in Cairo Press - Cairo - Egypt; 307 p.

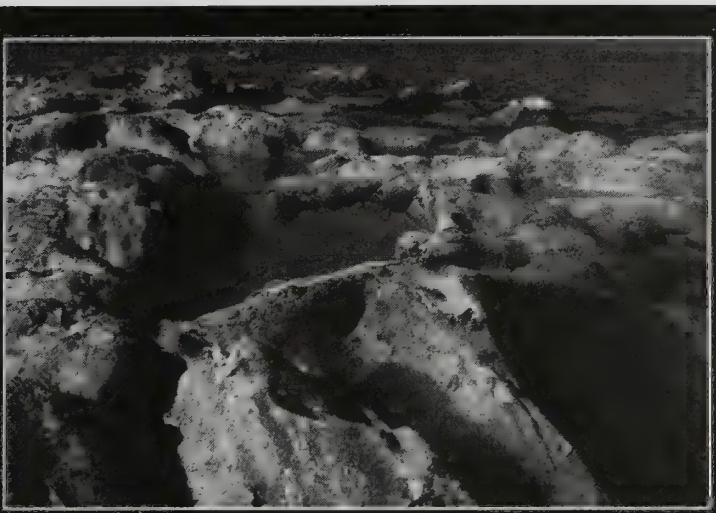
Zenetos, A., Gofas, S., Russo, G. & Templado, J. [2003] 2004. *CIESM Atlas of Exotic Species in the Mediterranean - Volume 3 Molluscs.* Frederic Briand, Editor CIESM Publisher / Monaco; 376 p.

LÉGENDES

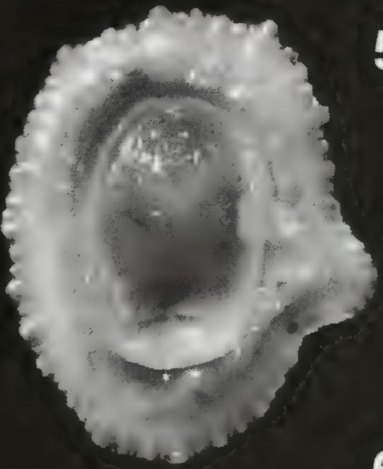
Figure 1	Golfe d'Iskenderun - situation géographique	
Figure 2	Golfe d'Iskenderun - implantations industrielles	
Figure 3	Région de Yumurtalik	
Figure 4	Environnement rocheux marin aux alentours de Yumurtalik	
Figure 5	*Siphonaria crenata* - spécimen vivant - face ventrale	+/- 20 mm
Figure 6	*Siphonaria crenata* - *Patella caerulea* et balanes in situ	
Figure 7	*Siphonaria crenata* - face dorsale	24,3 x 16,9 mm
Figure 8	*Siphonaria crenata* - face ventrale	24,3 x 16,9 mm
Figure 9	*Siphonaria crenata* - face dorsale	22,0 x 16,7 mm
Figure 10	*Siphonaria crenata* - face ventrale	22,0 x 16,7 mm

--

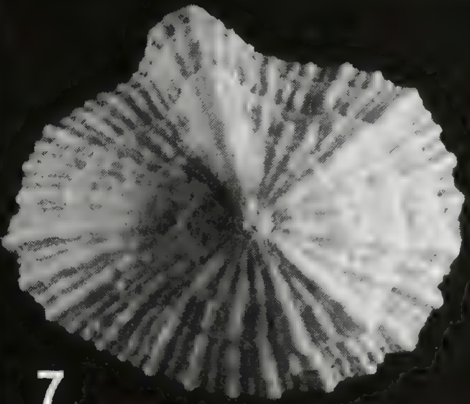
--------------------



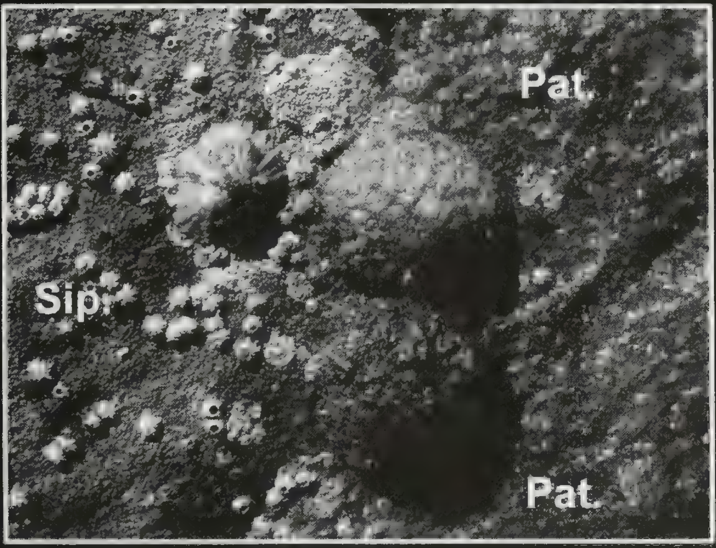
4



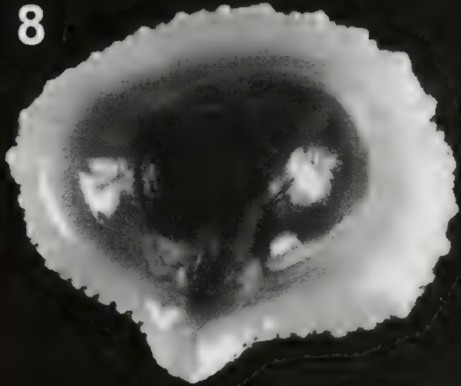
5



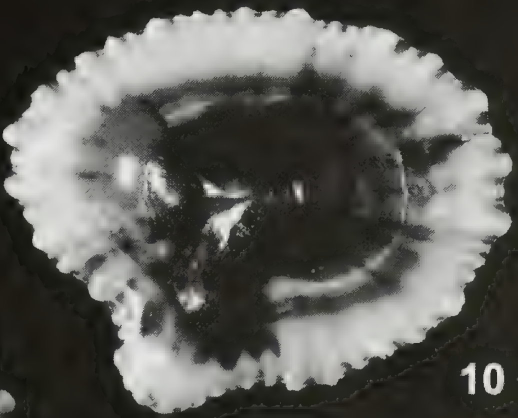
7



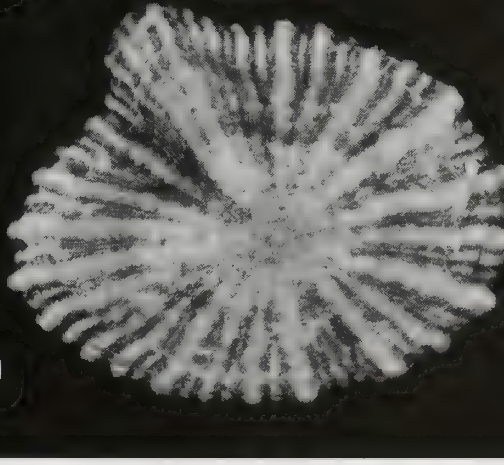
6



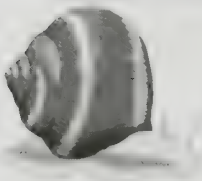
8



10



9



Etymologie et malacologie dans deux sites naturels du nord-est de Bruxelles – Deuxième partie

Jean-Philippe COPPEE
CEBE ASBL – www.cebe.be
Rue Jean-Baptiste Mosselmans, 44 – B - 1140 Bruxelles – jp.coppee@yucom.be

Introduction

Dans un numéro précédent, nous avons approché quelque peu la systématique et la formation du nom scientifique d'une espèce. Ensuite, nous avons passé en revue les quatre bivalves (coquillages) présents à l'Hof ter Musschen et au Moeraske, ces deux sites naturels du nord-est de la Région de Bruxelles-Capitale.
Dans cet article, nous poursuivons notre voyage au royaume des mots et des mollusques en abordant les gastéropodes dulcicoles qui hantent les eaux de ces 2 zones vertes bruxelloises.
La classe des gastéropodes (*Gastropoda*) reprend les mollusques connus communément sous les noms d'escargots et de limaces.
Gastropoda est composé de « gastéro- », du grec « gastêr, gastros » qui signifie « ventre » ou « estomac », et de « -pode », du grec « pous, podos » qui veut dire « pied ».
Le qualificatif « dulcicole » vient de l'adjectif latin « dulcis » (doux) et du verbe latin « colere » (habiter). Le suffixe « -cole » doit être compris comme « qui vit, qui croît (dans) ».
Le terme « dulçaquicole » est parfois utilisé comme synonyme. On y retrouve les racines précédentes ainsi que la racine « aqua » (« eau » en latin).
Les gastéropodes dulcicoles (« zoetwaterslakken » en néerlandais) sont donc les escargots qui vivent dans l'eau douce, que celle-ci soit stagnante ou courante.

Pour tout un chacun, il n'est pas toujours facile de définir le milieu dans lequel un mollusque vit. En effet, l'énorme majorité des escargots et des limaces affectionne les milieux humides, parfois franchement mouillés. Ce n'est pas pour autant qu'ils peuvent être qualifiés d'aquatiques.
De plus, il est fréquent qu'un escargot terrestre se noie dans une mare ou un cours d'eau. Trouver une coquille lors d'une prospection dans ce milieu ne signifie donc pas toujours que l'animal y vive.

Afin de systématiser notre revue des espèces présentées, nous avons abordé ces animaux famille par famille, en appliquant la succession proposée dans la « Checklist of species-group taxa of continental Mollusca living in Belgium (Clecom Section I) ».

Famille des Bithyniidae

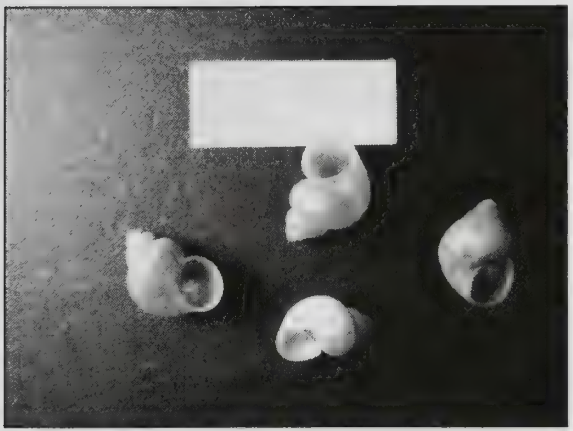
La Bithynie est une région du nord-ouest de l'Asie mineure en bordure de la mer Noire et de la mer de Marmara. Elle est connue depuis l'Antiquité et correspond actuellement au nord de l'Anatolie. La Bithynie était dénommée « Bithynia » en latin et « Bithunia » en grec.
La liaison entre les noms de genre et de la famille avec cette région géographique n'a pas pu être retrouvée. Certains estiment cependant que le terme pourrait dériver de la racine grecque « buthos » qui signifie « fond, abîme, gouffre ». Cette idée de profondeur se retrouverait ainsi dans le nom néerlandais de ces animaux (diepslakken), et ferait référence au fait que ces gastéropodes semblent peu dépendants de la profondeur du milieu aquatique dans lequel ils évoluent. En effet, ils peuvent vivre dans des eaux peu profondes comme à plus grande profondeur.

Deux espèces de cette famille sont présentes à l'Hof ter Musschen.

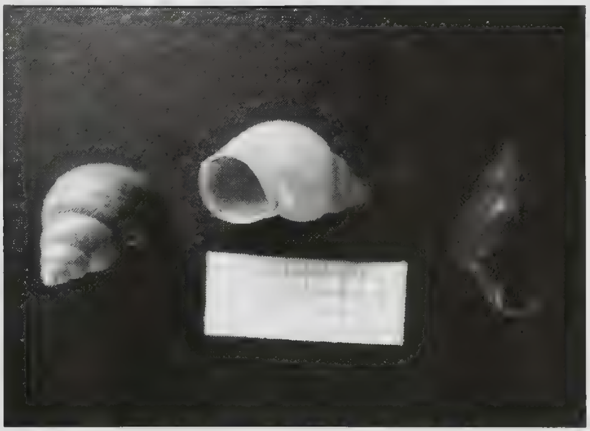
Bithynia tentaculata (Linnaeus, 1758)
Tentaculata vient du latin « tentaculata » qui signifie "avec des tentacules", cet escargot aquatique présentant de longs et fins tentacules. Précisons cependant qu'il ne s'agit pas d'une caractéristique propre à cette espèce, la suivante ayant également cette particularité.

Cette *Bithynia* (h : 16 mm ; diamètre : 8,5 mm) est qualifiée de « grande » en néerlandais (grote diepslak) et de "commune" en anglais et en allemand (common bithynia et Gemeine Schnauzenschnecke). En allemand, le nom de genre «Schnauzenschnecke » est plus énigmatique. Si « schnecke » signifie « escargot » ou « vis » et parle de lui-même, « Schnauzen » (de « Schnauze » (= museau, bec)) est moins évident.

En langue française, elle est dénommée « bithynie impure », voire « paludine sale ».



Bithynia leachii (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB



Bithynia tentaculata (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Bithynia leachii (Sheppard, 1823)
Le nom de cet escargot de plus petite taille (h : 5 à 9 mm ; diamètre : 3 à 6 mm) fait référence au zoologiste anglais William Elford Leach (1790-1836) qui a notamment décrit le genre *Bithynia*. Il travailla au British Museum où il s'occupa des collections. Il y devint conservateur-assistant au département d'histoire naturelle et se spécialisa dans l'étude des crustacés et des mollusques.
Ce zoologiste s'attela aussi à la description d'espèces. A titre d'exemple, il en nomma 27 à partir du nom de son ami J. Cranch, décédé en Afrique, et 9 à partir d'anagrammes tirés du prénom Caroline.
L'origine de certains noms scientifiques peut donc parfois reposer sur des réalités peu… cartésiennes. Mais ne dit-on pas que le cœur a ses raisons que la raison ignore ?

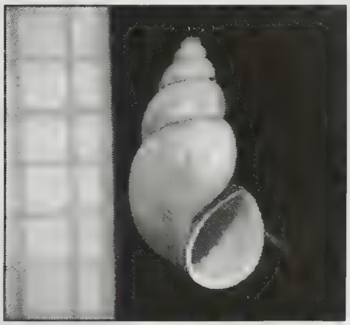
La référence à ce zoologiste se retrouve dans le nom anglais de ce mollusque : Leach's Bythinia. Littéralement, comme pour le nom scientifique, il s'agit donc de la « bithynie de Leach », nom qu'on lui donne également en français.
En néerlandais, on fait référence à la taille de l'escargot (kleine diepslak), celle-ci étant inférieure à l'espèce précédente *Bythinia tentaculata* (voir photos des deux espèces).
Le terme allemand « Bauchige Schnauzenschnecke » fait plutôt référence à la forme des spires qui, par comparaison avec l'espèce précédente, est plus bombée (Bauchige = bombé).

Famille des Hydrobiidae

Le nom de cette famille vient du terme grec « hudôr » qui signifie « eau » et qui a donné, p.ex., « hydro- » ou « hydrique ». On retrouve également la racine grecque « bios » qui veut dire « vie ».
Littéralement, Hydrobiidae est donc la famille des escargots « vivant dans l'eau ». Relevons immédiatement que ce n'est pas la seule famille dont les membres vivent dans l'eau.

Potamopyrgus antipodarum (J.E. Gray, 1843)
Présent tant au Moeraske qu'à l'Hof ter Musschen, *Potamopyrgus antipodarum* (J.E. Gray, 1843) peut pourtant être considérée comme une espèce invasive. Cette petite « tourelle » (h : 5 à 6 mm ; diamètre : 2,5 à 3 mm) fut découverte en 1859 dans l'estuaire de la Tamise et s'est probablement répandue en Europe à partir de cette région. Elle est découverte aux Pays-Bas en 1913.
Cette espèce fut décrite par E. A. Smith en 1889 et reçut les noms d'*Hydrobia jenkinsi* et de *Potamopyrgus jenkinsi.*

Zoologiste britannique, Edgar Albert Smith (1847-1916) fut, comme Leach, conservateur-assistant au British Museum. Il y étudia les mollusques, notamment ceux ramenés d'expéditions antarctiques.
Le nom d'espèce *jenkinsi* fut formé à partir du nom d'un naturaliste amateur et collectionneur de coquillages A. J. Jenkins qui récoltait du matériel pour Smith. Plus tard, on se rendit compte que l'espèce était identique à un gastéropode néo-zélandais *Potamopyrgus antipodarum* (J.E. Gray, 1843). Le nom *jenkinsi* fut donc considéré comme synonyme et modifié en fonction des règles de priorité du code de nomenclature zoologique en vigueur. L'auteur de la description John Edward Gray (1800 - 1875) est un autre zoologiste britannique ayant également travaillé au British Museum.
Les noms néerlandais et anglais font cependant toujours référence à cet hommage à Jenkins, cette espèce étant dénommée respectivement « Jenkins waterhoren » et « Jenkin's spire snail ».



Potamopyrgus antipodarum
(Hof ter Musschen)
Jean-Philippe Coppée
- Copyright © 2010 CEBE-MOB

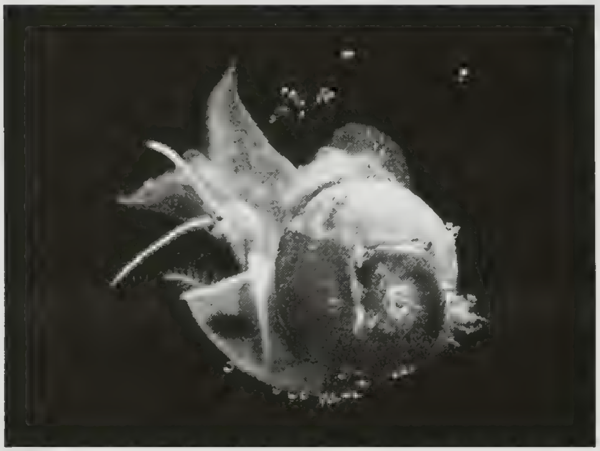
Le nom de genre *Potamopyrgus* est constitué à partir des mots grecs "potamos" qui signifie "fleuve, courant" (racine que nous retrouvons dans « hippopotame » ou « potamot ») et « pyrgos », « tour élevée, citadelle ». Ce genre se rencontre à la fois dans les eaux douces et saumâtres et la forme de sa coquille peut être assimilée à une (petite) tour.
Antipodarum vient du grec « antipodos » lui-même formé des deux termes « contre » et « pied ». La référence à l'origine néo-zélandaise de l'escargot est évidente, la Nouvelle-Zélande étant située aux antipodes de l'Europe occidentale. Cette origine néo-zélandaise se retrouve également dans le nom en langue allemande, cette espèce y étant dénommée « Neuseeländische Deckelsnecken ».

Famille des Valvatidae

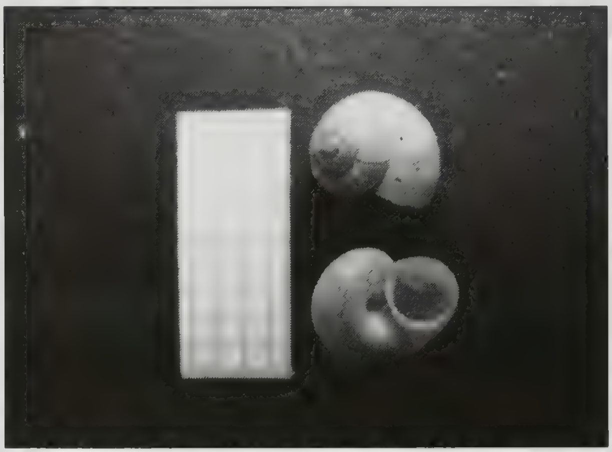
Le nom de cette famille trouve son origine dans le terme latin « valva » qui signifie « valve » ou « feuille ». Il est fait référence, comme pour le nom de genre *Valvata*, aux deux branchies externes particulièrement visibles sur l'animal vivant.
La famille est d'ailleurs dénommée « pluimdrager » en néerlandais, soit littéralement « porteur de plumes ». L'allusion aux deux branchies externes de cet escargot est évidente (voir photo ci-dessous).

Valvata piscinalis (O.F. Müller, 1774)
Ce petit escargot (h : 1 à 1,5 mm ; diamètre : 3 à 4 mm) présente une coquille enroulée en spirale. Il vit sur les plantes aquatiques et sur le fond des eaux stagnantes ou faiblement courantes. Pour nos sites, il n'est connu que de l'Hof ter Musschen.
Piscinalis vient du latin « piscina » (étang (de pisciculture)), lui-même dérivé de « pisces », signifiant « poisson ».

En français, cet animal est parfois dénommé « valvée piscinale ». Les noms anglais et allemand font référence au caractère commun de ce gastéropode (common valve-shell et Gemeine Federkiemenschnecke). En néerlandais, il est plutôt fait référence à l'habitat de l'espèce : vijverpluimdrager (vijver = étang).



Valvata piscinalis (une des deux branchies externes, en forme de plume, dépasse de l'ouverture de la coquille)
C. Ratton & Y. Finet - Copyright © 2010 CEBE-MOB



Valvata piscinalis (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Le responsable de la première description de cet escargot est Otto Friedrich Müller (1730-1784). Brillant zoologiste et naturaliste danois, nous lui devons pas mal de descriptions de mollusques. Bien qu'il ait étudié les champignons et la botanique, c'est dans l'étude des invertébrés qu'il excella.

Famille des Lymnaeidae

La famille des Limnées est bien représentée sur les deux sites bruxellois avec un total de 5 espèces différentes dont une seule, *Radix labiata,* n'est connue que de l'Hof ter Musschen.
Le nom de cette famille est dérivé du grec « limnè » qui signifie « lac », « mare » ou « étang ».
C'est cette même racine qui a donné « limnologie » en l'occurence la science qui se penche sur l'étude des eaux douces.
En français, les membres de cette famille sont dénommés « limnées » alors qu'en néerlandais, on les dénomme « poelslakken » (escargots des mares).

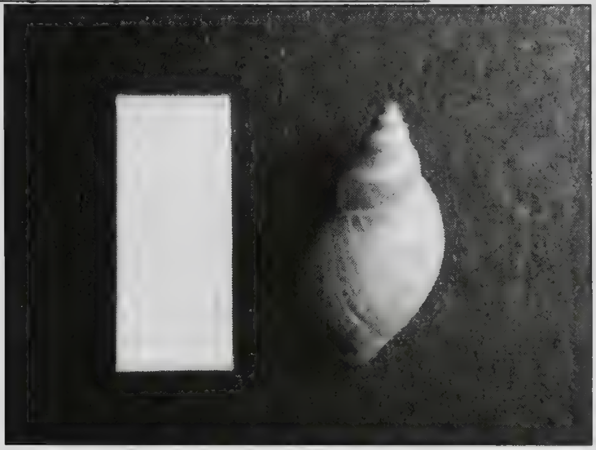
Galba truncatula (O.F. Müller, 1774)
Le nom de genre *Galba* vient soit du latin "galba" qui signifie "bedaine", soit du latin "galbus" signifiant "jaune". Les deux options semblent possibles. Les spires arrondies font pencher pour la première alors que la couleur de corne jaunâtre de la coquille justifierait la seconde.

Galba truncatula (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Le nom d'espèce *truncatula* vient du latin « truncatus », « tronqué ». La présence du suffixe « -ula » indique un diminutif. *Truncatula* signifie donc "un peu tronqué". Cette limnée est plus petite (h : 10 (15) mm ; diamètre = 5 mm) que les autres représentantes de cette famille et cette particularité est reprise dans sa dénomination française, anglaise et allemande (limnée naine, « dwarf pond snail » et « Kleine Sumpfschnecke » (Kleine : petit, Sumpf : marais et Schnecke : escargot)).
En français, elle peut également être dénommée « limnée tronquée », ce qui fait référence à son nom scientifique.
En néerlandais, cette espèce est dénommée « leverbotslak », ce qui peut être traduit littéralement par « l'escargot de la douve du foie ». On retrouve également cette appellation dans un autre nom commun allemand attribué à cet animal : « Leberegelschnecke ».

La douve du foie est un ver plathelminthe parasite (*Fasciola hepatica*) qui vit dans les canaux biliaires des moutons et des bovins (et parfois de l'homme) mais qui réalise une partie de son cycle de reproduction aux dépens de *Galba truncatula*. Les noms néerlandais et allemand font donc référence au fait que cette limnée héberge temporairement ce parasite.

Stagnicola palustris (O.F. Müller, 1774)



Stagnicola palustris (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

La racine latine « stagnum » (eaux dormantes) se retrouve dans le nom de genre *Stagnicola*, accompagnée du suffixe « -cola » qui provient du latin « colere » (habiter). La traduction littérale sera donc : « qui habite les eaux dormantes ».

Le nom d'espèce *palustris* fait directement référence à l'habitat du mollusque, le mot latin « palustris » signifiant « du marais ». Les noms français (limnée des marais), néerlandais (moeraspoelslak) et anglais (marsh snail) se plaisent à rappeler cette origine. La dénomination allemande (Gemeine Sumpfschnecke) fait elle référence au caractère commun du mollusque.

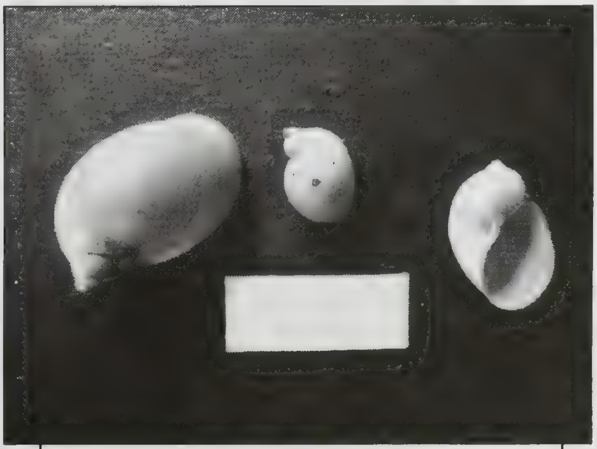
De taille intermédiaire (h : 30 mm ; d : 15 mm), cette limnée se rencontre tant au Moeraske qu'à l'Hof ter Musschen.

Radix labiata (Rossmässler, 1835)

Le nom de genre *Radix* doit provenir probablement du latin « radix » signifiant « racine », mais le lien entre cette racine latine et le nom du genre nous est resté inconnu.

Les deux espèces de *Radix* rencontrées à l'Hof ter Musschen sont morphologiquement très proches l'une de l'autre.
La première espèce abordée est *Radix labiata* (h : 20 mm ; d : 15 mm).
Labiata vient du latin « labrum » ou « labra », « lèvre ». « Labiata » peut être traduit par « qui a des lèvres ». Nous pouvons peut-être supposer qu'il est ici fait référence à l'épaississement de la columelle (axe de la coquille). Notons cependant que cette caractéristique est présente chez beaucoup d'espèces de limnées.

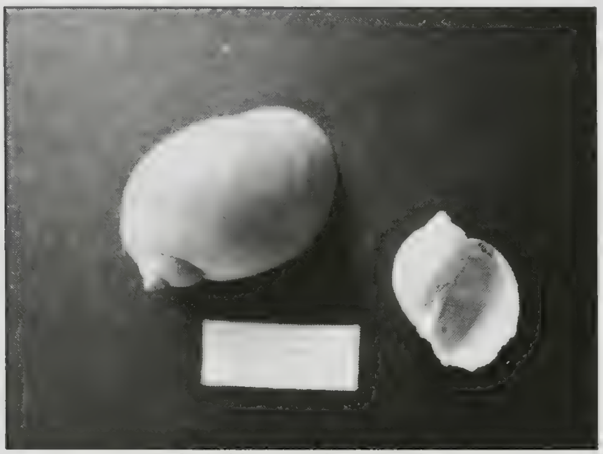
Pour cette limnée, on trouve un synonyme fréquent dans la littérature, à savoir *Radix peregra*.



Radix labiata (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Peregra vient du latin « peregre » qui signifie « à l'étranger, étranger » et qui a, par exemple, donné « pèlerin » ou « pérégrination » en français.
Il faut peut-être y voir une référence au caractère « voyageur » de ces animaux à la surface de l'eau (voir *Lymnaea stagnalis*).
Le nom anglais (wandering pond snail) mentionne aussi ce caractère voyageur (wandering : errance, dérive).
En allemand, comme pour *Stagnicola palustris*, on souligne le caractère « commun » de cet escargot (Gemeine Schlammschnecke) (Gemeine: commun, Schlamm : vase, boue et Schnecke : escargot).
En néerlandais, cette espèce est dénommée « begroeide poelslak », ce qu'on pourrait traduire par « limnée couverte ». En effet, il n'est pas rare de trouver des coquilles de cette espèce entièrement recouverte (encroûtée) par des algues.
Cette espèce fut décrite par Adolf Emil Rossmässler (1806-1867), malacologue allemand qui fut également professeur d'histoire naturelle et homme politique.

Radix balthica (Linnaeus, 1758)


Radix balthica (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

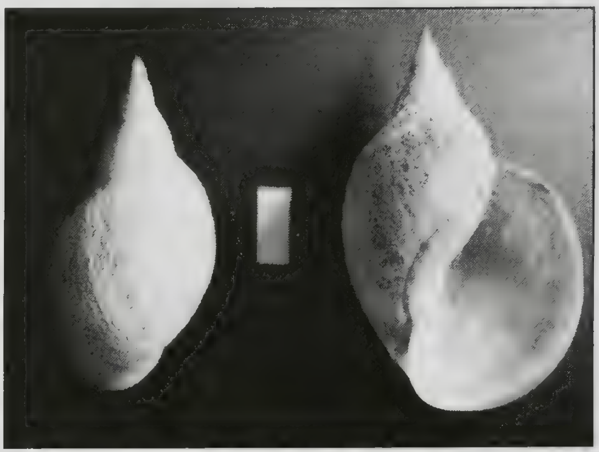
Balthica fait référence à la zone géographique de la Baltique. Ici aussi, le lien entre le nom d'espèce et cette région n'a pas pu être réalisé.

Auparavant, cette limnée a également porté le nom de *Radix ovata*.
Ovata, en latin, signifie « ovale » et a trait à la forme de l'ouverture de la coquille. Ce nom d'espèce est encore fréquemment rencontré dans la littérature et est repris dans le nom néerlandais (ovale poelslak).
Le nom en langue allemande y fait également référence en associant l'animal à la forme ovale de l'œuf (*Eiförmige Schlammschnecke*). Cette limnée est plus grande (h : 30 mm ; d : 20 mm) que l'espèce précédente.

Lymnaea stagnalis (Linnaeus, 1758)
L'étymologie du nom de genre *Lymnaea* est la même que celle évoquée pour la famille. Le nom d'espèce *stagnalis* fait référence à l'habitat de la limnée, *stagnalis* dérivant du latin « stagnum » qui signifie « eaux dormantes, stagnantes ».

Le suffixe « -alis » (génitif) précise l'origine : il s'agit donc, littéralement, de la « limnée des eaux stagnantes ».
Les noms français, néerlandais et anglais font référence à cet habitat : limnée des étangs, « gewone (ou « grote ») poelslak » (le (grand) escargot commun des mares) et « stagnant pond snail » (l'escargot des étangs (stagnants)).
Le qualificatif « grand » que l'on retrouve dans certaines dénominations néerlandaises est justifié puisqu'il s'agit effectivement d'un escargot aquatique de taille respectable (h : 80 mm ; diamètre : 35 mm).
Le nom allemand « Spitzhornschnecke » fait état d'une autre particularité morphologique, à savoir le sommet très pointu de la coquille.

Lymnaea stagnalis (Moeraske)
Cédric Coppée - Copyright © 2010 CEBE-MOB


Lymnaea stagnalis (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

En français, on retrouve parfois la mention de « limnée voyageuse ». Ce qualificatif fait probablement référence au fait que cette limnée se déplace sous la surface de l'eau, de la même manière qu'un escargot se déplacerait sur le sol. Elle en profite pour aspirer l'air dont elle a besoin pour respirer.

Famille des Physidae

Le nom de cette famille est à retrouver dans le terme grec « phusa » (vésicule, cloche, soufflet). On fait ici référence à la dernière spire de la coquille qui est grande et gonflée.

Physella acuta (Draparnaud, 1805)

Physella est le diminutif d'un autre nom de genre (*Physa*). En effet, la présence du suffixe « -ella » nous donne cette indication. Il s'agit donc d'une petite *Physa*.
Acuta souligne un caractère de la coquille dont le sommet se termine en une pointe aigue (« acuta » signifiant « aigu » en latin).
Les noms néerlandais (puntige blaashoren), anglais (lateritic physa, tadpole snail, acute bladder snail) et allemand (Spitze Blasenschnecke) mentionnent également cette caractéristique de la coquille.
Ce petit escargot (h : 14 mm ; d : 9 mm) est présent au Moeraske et à l'Hof ter Musschen.

Jacques Draparnaud, l'auteur de cette description, est un naturaliste, malacologue et botaniste français.
Il est considéré comme le père de la malacologie continentale française. On lui doit notamment un « Tableau des Mollusques terrestres et fluviatiles de la France » paru en 1801 et surtout, en 1805, une « Histoire naturelle des Mollusques terrestres et fluviatiles de la France ».

Physella acuta (Moeraske)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Famille des Planorbidae

Les relevés malacologiques mentionnent six espèces différentes pour ces 2 sites. Une seule, *Planorbis carinatus* est seulement présente au Moeraske, les 5 autres n'étant connues que de l'Hof ter Musschen.

Le nom de cette famille fait référence à la géométrie et est composé de deux termes latins à savoir « planus » (plat) et « orbis » (cercle, disque). Ceci est à mettre en relation avec la forme de la coquille de ces escargots. En français, ce sont ces mêmes racines qui vont être à l'origine du nom de genre « planorbe » qui sera utilisé dans les dénominations des six espèces présentées.

Planorbarius corneus (Linnaeus, 1758)

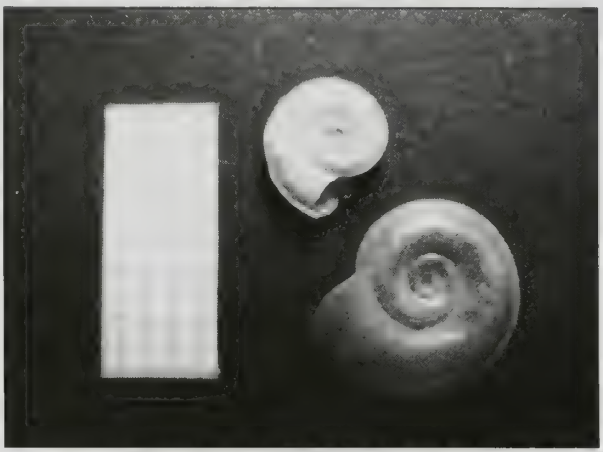
Planorbarius corneus (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Le genre *Planorbarius* est composé à partir du nom de genre *Planorbis* et du suffixe « -arius » (appartenant à) ce qui fait référence à la parenté avec les deux espèces suivantes.
Corneus vient du latin « corneus » (comme pour *Sphaerium corneum* (voir le précédent numéro de Novapex/Société)) qui signifie « corne ». Dans ce cas-ci également, il est fait probablement référence à la couleur cornée de la coquille (ou alors à la corne en tant qu'instrument à vent (similitude avec le cor)).

En langue française, le nom commun est la simple traduction du nom scientifique (planorbe corné). Les dénominations néerlandaise (posthorenslak) et allemande (Posthornschnecke) sont à la fois musicales et morphologiques en s'inspirant du cor postal. En anglais, cette espèce est nommée « trumpet shell » ou « great ramshorn snail » (ramshorn : corne de bélier).

Comme la coquille de cet escargot aquatique peut avoir une certaine taille (h : 15 mm ; d : 35 mm), le qualificatif « great » n'est donc pas usurpé. Notons cependant que les exemplaires trouvés à l'Hof ter Musschen étaient de moins grandes dimensions .

Planorbis planorbis (Linnaeus, 1758)



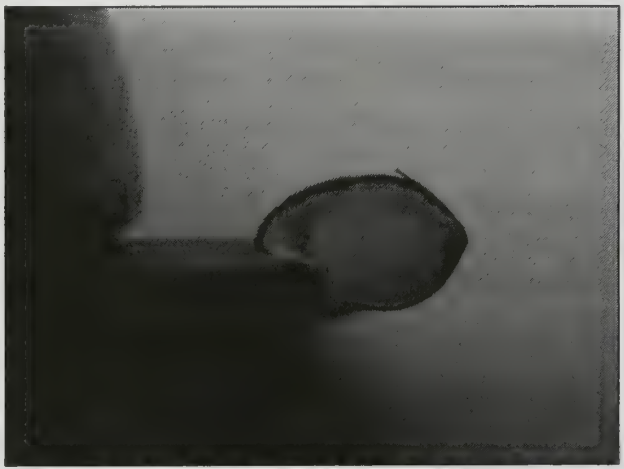
Planorbis planorbis (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Planorbis planorbis est de forme discoïde et de taille moyenne (h : 4 mm ; d :20 mm). Ce nom de mollusque, en ayant le même nom de genre que d'espèce, nous permet de montrer un bel exemple de tautologie autorisée par le Code de nomenclature zoologique.
En néerlandais, certains planorbes sont repris sous le vocable particulièrement évocateur de « schijfhoren », composé de « schijf » (= disque) et de « horen » (= contraction pour cor (corne)). En néerlandais, *P. planorbis* porte le nom de « (gewone) schijfhoren » (= le planorbe commun).
En allemand, ce planorbe porte le doux nom de « Gemeine Tellerschnecke ». La traduction littérale de « Tellerschnecke » pourrait être l' « escargot-plateau » ou l' « escargot-assiette ». « Gemeine » exprime le caractère commun de l'animal.
La morphologie de ces mollusques a également inspiré les Britanniques qui les dénomment simplement «ramshorn » (corne de bélier).

Planorbis carinatus (O.F. Müller, 1774)
Le nom d'espèce *carinatus* a été inspiré du latin « carina » qui peut signifier : « coquille de noix », « quille » ou « carène (d'un bateau) », « navire », ou bien encore « corps (d'un animal) en forme de carène ».
C'est bien évidemment cette dernière traduction qui s'impose lorsqu'on observe la coquille de ce planorbe.

C'est tout naturellement que les noms communs en différentes langues feront référence à cette carène : planorbe carénée, « gekielde schijfhoren » (néerlandais), « Gekielte Tellerschnecke » (allemand) ou « keeled ramshorn » (anglais).

Planorbis carinatus (Moeraske)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

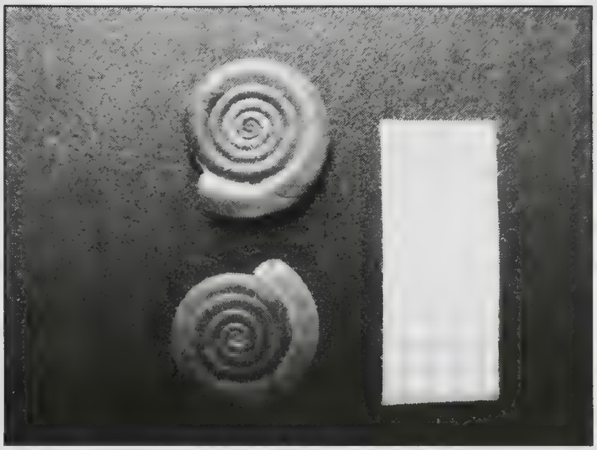


Planorbis carinatus – détail de la carène (Moeraske)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

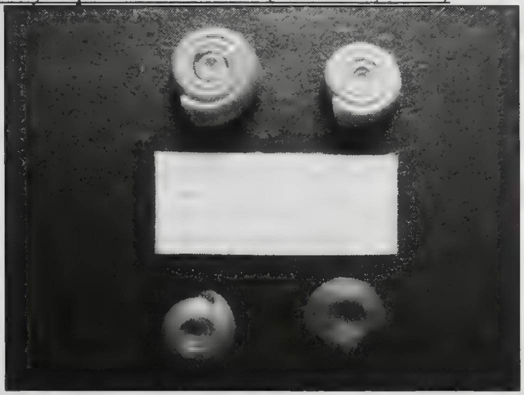
Anisus vortex (Linnaeus, 1758)
Ce planorbe est plus petit (h : 2 mm ; d : 12 mm) que les trois espèces précédentes. Comme celles-ci, il apprécie les eaux stagnantes ou calmes à végétation aquatique développée.
L'étymologie du nom de genre *Anisus* pourrait avoir deux origines.
Une première possibilité serait qu'*Anisus* pourrait provenir du grec « anèson » (dille ou anis) qui aurait donné « anisus » en latin. Le lien entre l'anis et l'escargot est par contre assez difficile à mettre en évidence.

La seconde possibilité, plus vraisemblable, est qu'*Anisus* ferait référence au préfixe « aniso- » (non égal à, inégal). En effet, ce genre a d'abord été décrit comme appartenant au genre *Planorbis*. Par la suite, en en faisant un genre à part, on prenait donc le contrepied de la première classification.
Le nom d'espèce *vortex* signifie « tourbillon » et se rapporte à la spirale régulière de la coquille qui n'est pas sans évoquer la forme d'un tourbillon.

Ce terme se retrouve tant dans les dénominations française (planorbe tourbillon) que néerlandaise (draaikolkschijfhoren) ou anglaise (whirlpool ramshorn). En allemand, cet escargot est appelé « Scharfe Tellerschnecke ». « Scharfe » signifie « coupant » ou « tranchant » . Il est sans doute fait ici référence à l'extrême finesse de la coquille et de la petite carène qui présente une arête tranchante.


Anisus vortex (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Bathyomphalus contortus (Linnaeus, 1758)


Bathyomphalus contortus (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

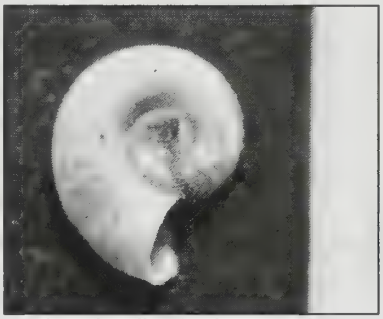
Bathyomphalus vient des mots grecs « bathus » (profond) et « omphalos » (ombilic).
Le nom d'espèce *contortus* vient du latin et signifie « enroulé » ou « tourné ».

La dénomination française fait toujours référence au terme générique « planorbe » : planorbe contourné.
Les noms néerlandais (riempje, littéralement « petite courroie/ceinture ») et allemand (Riementellerschnecke) s'inspirent de la morphologie de ce petit escargot (h : 2 mm ; d : 8 mm) qui évoque une ceinture enroulée.

Gyraulus albus (O.F. Müller, 1774)

Gyraulus vient probablement du grec « guros » (courbé, tordu) et du latin « gyrus » (cercle).
Albus signifie blanc en latin. Cette épithète est à mettre en rapport avec la couleur très claire de la coquille, qui est plutôt jaune verdâtre (voire brun pâle), que blanche.

Les dénominations néerlandaise (witte schijfhoren), anglaise (white ramshorn) et allemande (Weisses Posthörnchen) font toutes référence à la blancheur citée dans le nom scientifique de ce petit planorbe (h : 1,5 à 2 mm ; d : 6 à 9 mm).


Gyraulus albus (Hof ter Musschen)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

(à suivre)

Bibliographie sommaire
Les références ci-dessous reprennent les ouvrages et sites qui ont été les plus consultés. Certains sites Internet ont été consultés de manière sporadique afin de vérifier une orthographe, un détail ou de recouper une traduction. Ces sites ne sont pas repris dans cette bibliographie.
Les capacités d'Internet permettent par ailleurs de consulter des livres anciens, p.ex. datant du XIX^{ème} siècle et qui ont permis de rechercher des étymologies parfois peu évidentes.
Enfin, il faut souligner le précieux site de l'association néerlandaise ANEMOON (ANalyse Educatie en Marien Oecologisch Onderzoek) qui a dédié une section entière à l'étymologie des mollusques continentaux des Pays-Bas. Ce site fut d'une importance capitale pour la structure des recherches et la rédaction de cet article.

ADAM William. Mollusques – Tome I : Mollusques terrestres et dulcicoles. Bruxelles : Patrimoine de l'IRSNB, 1960, 402 p. (Faune de Belgique)

ANEMOON (ANalyse Educatie en Marien Oecologisch Onderzoek). Atlasproject Nederlandse Mollusken : Etymologie [en ligne]. Disponible sur : <http://www.anemoon.org/anm/etymologie> (consulté les 2/08/2007 et 28/03/2008)

BACKELJAU T. et al. De Rode Lijst van de landslakken in Vlaanderen [en ligne]. Brussel : Instituut voor Natuurbehoud, en préparation. Disponible sur : http://www.inbo.be/content/page.asp?pid=BEL_VLA_SOO_rodelijst (consulté le 12.12.2006)

CUVIER F. Dictionnaire des sciences naturelles,... suivi d'une biographie des plus célèbres naturalistes [en ligne]. Paris : F.G. Levrault, 1818. Disponible sur : <http://books.google.fr/books?id=qmJIAAAAMAAJ> (dernière consultation février 2009)

JOURDAN A. J. L. Dictionnaire raisonné, étymologique, synonymique et polyglotte, des termes usités dans les sciences naturelles [en ligne]. Paris : Baillière, 1834. Disponible sur : <http://books.google.be/books?id=LlFhKnHEgSgC&hl=fr> (dernière consultation février 2009)

JUNGBLUTH J.H. et VON KNORRE D. Trivialnamen der Land- und Süßwassermollusken Deutschlands (Gastropoda et Bivalvia). In Mollusca 26 (1) Dresden, Allemagne, 2008, pp 105-156. Disponible sur : <http://globiz.sachsen.de/snsd/publikationen/mollusca-journal/mollusca_26-1-2008/08_Jungbluth.pdf>

Muséum d'Histoire Naturelle de Göteborg (GNM) - CLECOM Project Checklist of species-group taxa of continental Mollusca living in Belgium. (CLECOM Section 1). Göteborg, Suède : Göteborgs Naturhistoriska Museum, 2002, 17 p.

Nederlandse Malacologische Vereniging. Soortenlijst Nederland – Landslakken [en ligne]. Disponible sur : <http://www.spirula.nl/malacologie/nl_soorten/nl_land.htm > (consulté le 21.11.2007)

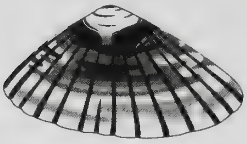
Nederlandse Malacologische Vereniging. Soortenlijst Nederland - Zoet- en brakwater [en ligne]. Disponible sur : <http://www.spirula.nl/malacologie/nl_soorten/nl_zoet.htm> (consulté le 21.11.2007)

Université Catholique de Louvain Itinera Electronica - Collatinus - Dictionnaire Jeanneau (Latin-Français) [en ligne]. Disponible sur <http://collatinus.fltr.ucl.ac.be/jano/> (dernière consultation février 2009)

Université de Neuchâtel. Liste des mollusques de Suisse [en ligne]. Neuchâtel, Suisse : Université de Neuchâtel, 2007. Disponible sur : <http://www2.unine.ch/webdav/site/cscf/shared/documents/liste_especes/MOL_2007.xls> (consulté le 25.04.2008)

VILVENS C. et al. Tome IV : Gastéropodes dulcicoles. Jodoigne, Belgique : Société Belge de Malacologie, 2008, 60 p. (Mollusques terrestres et dulcicoles de Belgique)

WAIENGNIER E. Relevé d'excursion au Moeraske. In Arion 24(1). Bruxelles : Société Belge de Malacologie, 1999, p 3



L'écho des réunions

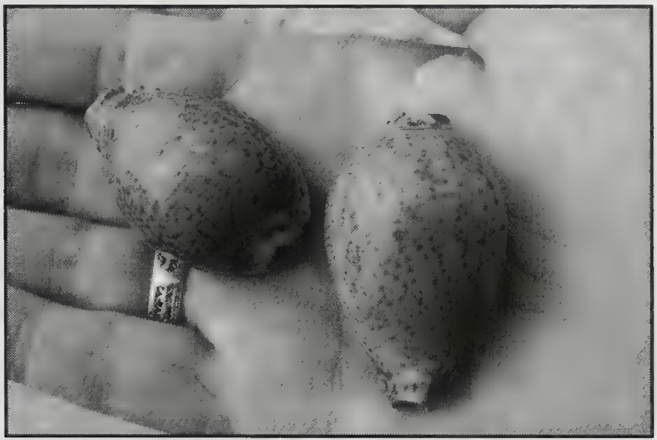
Etienne MEULEMAN

Réunion du 12 décembre 2009 (EM) → **Roland Scaillet & Christiane Delongueville : Les Iles Kerkennah (Tunisie)**

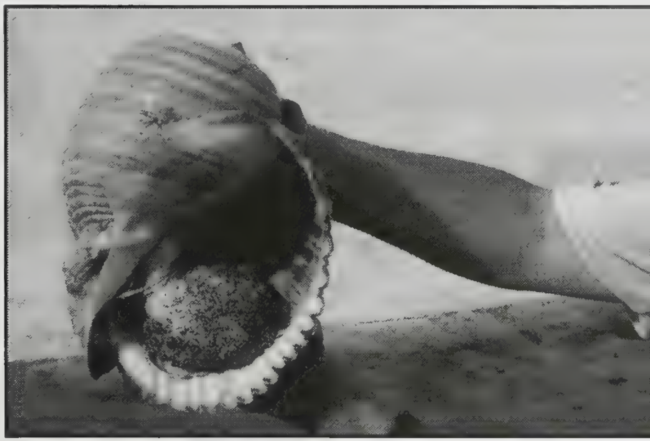
C'est toujours avec un grand plaisir que nous accueillons nos spécialistes des mollusques européens. Lorsque Roland et Christiane nous présentent leur conférence, c'est comme si nous partions en voyage vers une destination inconnue ! Ils ne se contentent pas de nous exposer une liste de coquillages récoltés, mais ils nous font découvrir aussi la région visitée avec ses paysages, ses habitants, ses coutumes.

Cette fois, ils nous ont emmenés dans les îles Kerkennah (personnellement je n'en n'avais jamais entendu parler !), un petit archipel situé au large de la Tunisie dans le Golfe de Gabès. Cet archipel est constitué de 6 îles dont deux principales (GHARBI et CHERGUI). Ces îles jouissent d'un climat à la limite entre le tempéré méditerranéen et le subtropical saharien caractérisé par une faible pluviosité. Ce faible apport en eau douce entraîne une forte salinité de l'eau et l'on peut y retrouver une faune typique.

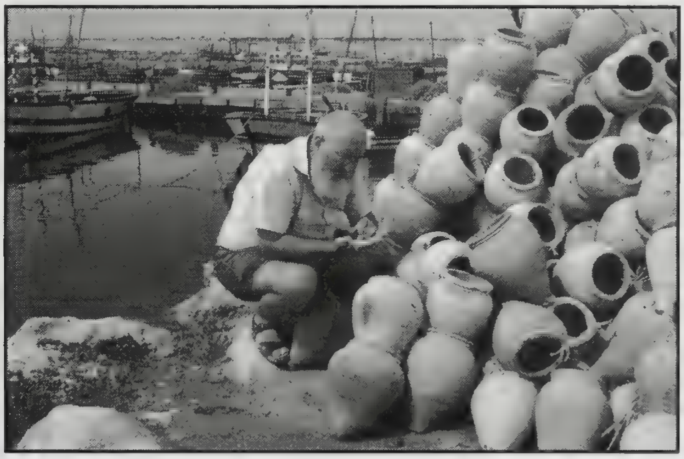
Durant l'exposé, nous avons découvert les différents aspects de ces îles. Tout d'abord, comment y arriver ! Visiblement, il n'existe pas un train direct qui nous emmène de Bruxelles à Sidi Youssef sur l'île de Chergui ☺. Ensuite Roland nous a décrit les différents types de paysages (cela fait rêver!), la faune et la flore locale et ses habitants avec leur accueil chaleureux. Pour terminer, nous avons pu nous délecter de quelques belles coquilles récoltées dans les îles.



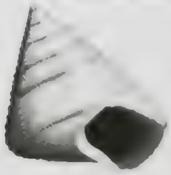
Erosaria turdus trouvées dans des gargoulettes



Tonna galea



Les fameuses gargoulettes, lieu intéressant pour des découvertes malacologiques…



Quoi de neuf ?

Claude VILVENS

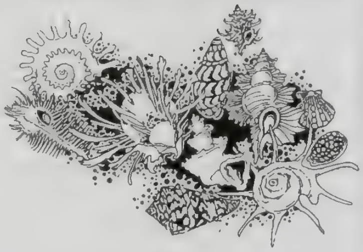
Comme chaque année : la Bourse d'Anvers de la BVC !

BELGISCHE VERENIGING VOOR CONCHYLIOLOGIE V.Z.W.
Belgian Society for Conchology - Association Belge de Conchyliologie

www.bvc-gloriamaris.be

20ième BOURSE INTERNATIONALE AUX COQUILLAGES

15 et 16 mai 2010
Antwerpen – Belgium

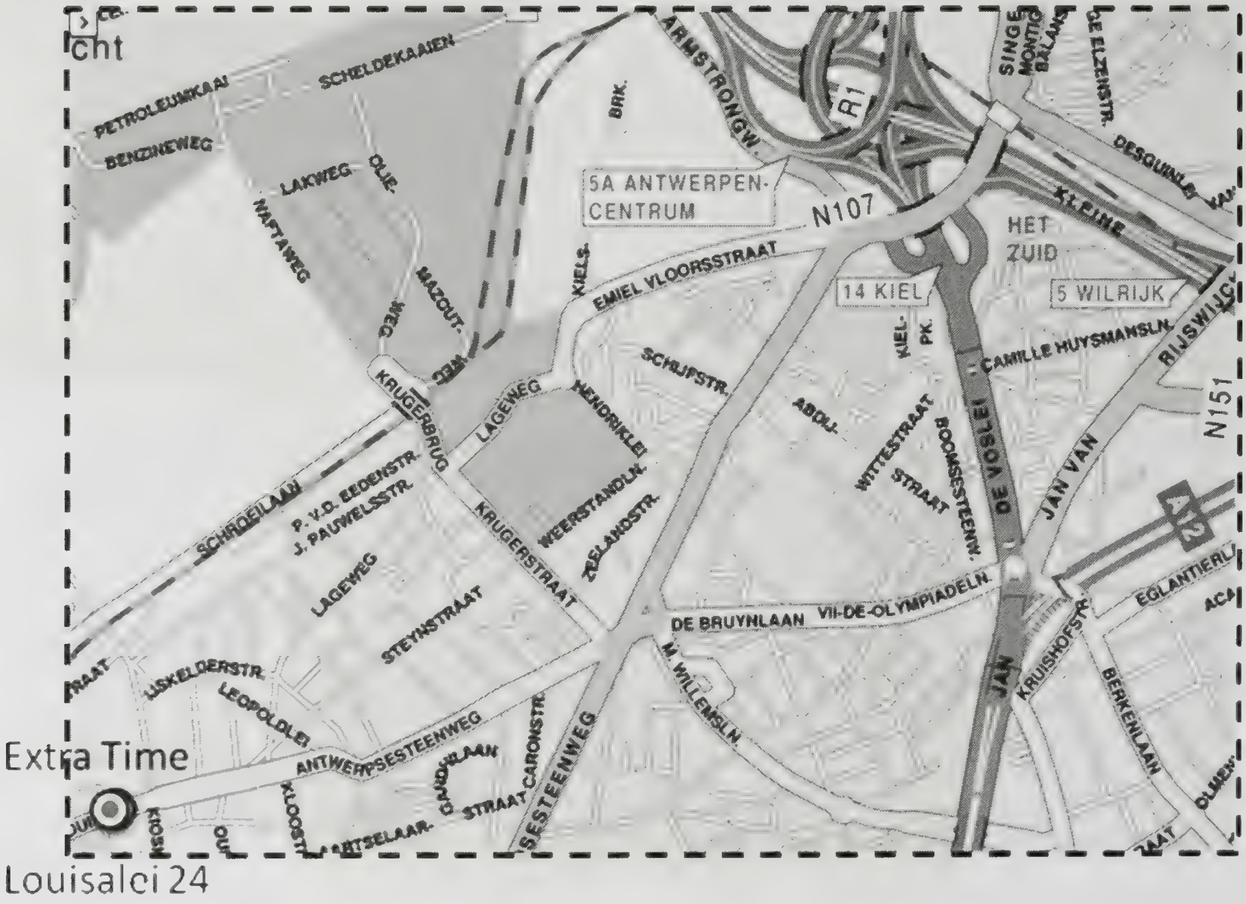


For information and reservations please contact :

C. Krijnen (secretary Shell Show)
Burg. Jansenstraat 10 - 5037 NC Tilburg - The Netherlands
Tel.: ++31 – (0)13 4630607 - e-mail: bvc.shellshow@planet.nl

Samedi 15 mai : 10 h – 18 h
Dimanche 16 mai : 10 h – 16 h

Sports hall Extra Time
Louisalei 24
2660 **Antwerpen - Hoboken**
http://www.extratime.be


Extra Time
Louisalei 24
SCHELDEKAAIEN
PETROLEUMKAAI
BENZINEWEG
LAKWEG
OLIE
NAFTAWEG
MAZOUT
ARMSTRONGW.
R1
5A ANTWERPEN-CENTRUM
N107
HET ZUID
KLEINE
DESGUINLEI
14 KIEL
5 WILRIJK
EMIEL VLOORSSTRAAT
CAMILLE HUYSMANSLN.
RIJSWIJCK
N151
SCHIJFSTR.
LAGEWEG
HENDRIKLEI
KRUGERBRUG
KRUGERSTRAAT
WEERSTANDLN.
ZEELANDSTR.
SCHROEILAAN
P. V.D. EEDENSTR.
J. PAUWELSSTR.
STEYNSTRAAT
WITTESTRAAT
BOOMSESTEENW.
DE VOSLEI
JAN VAN
A12
DE BRUYNLAAN
VII-DE-OLYMPIADELN.
M. WILLEMSLN.
KRUISHOFSTR.
EGLANTIERLAAN
BERKENLAAN
LEOPOLDLEI
ANTWERPSESTEENWEG
SESTEENWEG
CARONSTR.
KLOOSTER

Quelques nouvelles publications

Roland SCAILLET, Claude VILVENS & Roland HOUART

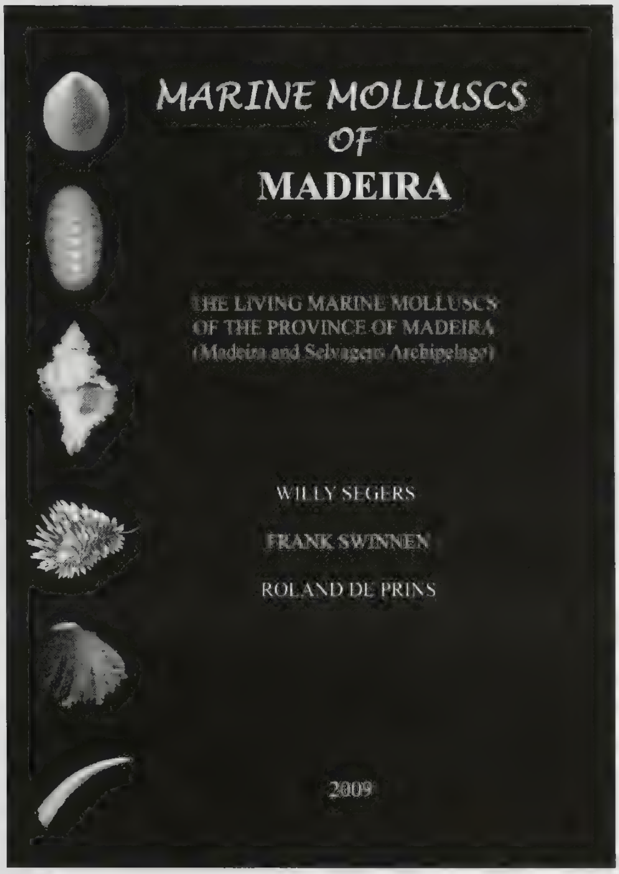
1. Quelques livres

MARINE MOLLUSCS OF MADEIRA

par **Willy Segers, Frank Swinnen & Roland De Prins**

pp. 1-612
Format A4, couverture cartonnée.
Prix: 89 €.

Editions Snoeck, 2009
Commande en ligne sur le site
http://www.madeira-seashells.com



MARINE MOLLUSCS OF MADEIRA

THE LIVING MARINE MOLLUSCS OF THE PROVINCE OF MADEIRA (Madeira and Selvagens Archipelago)

WILLY SEGERS

FRANK SWINNEN

ROLAND DE PRINS

2009

Voici un ouvrage prestigieux consacré aux mollusques marins de l'archipel de Madère et des îles Sauvages (Selvagens Ilhas). Il est l'aboutissement d'un long travail de recherche mené par des inconditionnels explorateurs de la biodiversité. Surtout ne boudons pas notre plaisir, une fois de plus, les auteurs sont belges. Ceci nous montre combien la malacologie est une discipline à l'honneur et bien vivante dans notre pays. Willy Segers, Frank Swinnen et Roland De Prins sont des figures réputées au sein de notre société sœur du nord du pays: de Belgische Vereniging voor Conchyliologie. Une courte biographie leur est consacrée en préambule de cet ouvrage.

Le livre est impressionnant, format A4, couverture cartonnée, 612 pages d'information concise, impression impeccable des planches, voilà quelques mots qui définissent l'emballage, Quant au contenu, c'est mieux encore, il traite de plus de 750 espèces différentes dont 11 sont nouvelles pour la science. Fallait-il prouver que nous sommes encore loin de tout savoir sur la richesse et la biodiversité du monde animal en général et de celui des mollusques en particulier ? Mission accomplie: les informations relatives à chaque espèces sont développées dans un ordre logique: citation dans la littérature, détail du matériel examiné, distribution, biotope et description concise de l'espèce. L'iconographie est superbe, plus de 1.200 représentations en quadrichromie, mêlant les photos traditionnelles aux images de microscopie électronique combien importantes pour la mise en évidence des caractéristiques spécifiques de la microsculpture et des protoconques de chaque espèce.

Ce livre ne s'adresse pas uniquement aux amateurs de ces deux régions spécifiques de l'Atlantique Nord-Est. Son contenu déborde de très loin sur des espèces répertoriées dans les îles Canaries, le long des côtes de la façade Nord-Atlantique (Europe/Afrique) et de la Méditerranée. Les spécialistes de ces régions trouveront matière à combler leurs besoins en iconographie spécifique.

Le prix du livre (hors frais d'expédition) s'élève à 89 €. Il peut être commandé en ligne sur le site http://www.madeira-seashells.com Ce site permet également de naviguer brièvement dans l'ouvrage et d'y apprécier la qualité de l'iconographie.

Avis aux amateurs et bonne lecture.

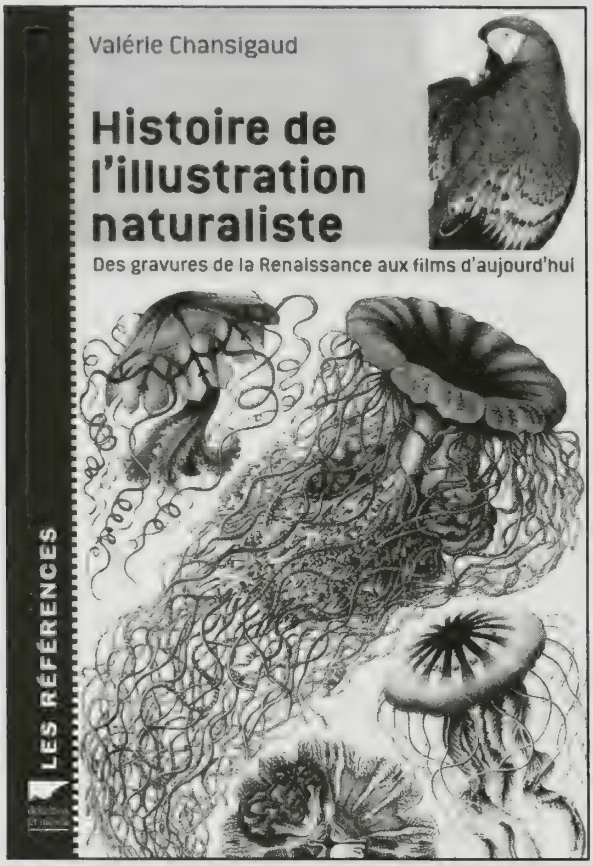
Roland Scaillet

HISTOIRE DE L'ILLUSTRATION NATURALISTE

par **Valérie Chansigaud**

pp. 1-239, nombreuses illustrations toutes couleurs.
Format 155x225 mm, couverture souple.
Prix: 30.97 euros + frais d'envoi

Delachaux et Niestlé
ISBN: 9 782603 016008


Valérie Chansigaud
Histoire de l'illustration naturaliste
Des gravures de la Renaissance aux films d'aujourd'hui
LES RÉFÉRENCES

Ce livre oppose non seulement un parcours historique au pays de l'illustration naturaliste, mais aussi un certain nombre de réflexions à son sujet. Ainsi :

◆ une illustration naturaliste n'est pas seulement une copie de la nature, mais aussi, et surtout, le reflet des connaissances scientifiques de l'époque : "on y représente ce que l'on sait et ce que l'on veut montrer";
◆ la présence d'images en couleur dans un livre représente un travail complexe et coûteux à toutes les époques;
◆ pour certains naturalistes, une image donne une meilleure explication qu'une description textuelle, alors que pour d'autres "le texte nourrit l'esprit alors que l'image donne seulement du plaisir aux yeux".

Du point de vue historique, les grandes époques sont passées en revue :

◆ la Renaissance, avec les botanistes tout d'abord puis les premiers zoologistes, l'imprimerie est encore une technique coûteuse;
◆ le XVIIème siècle : la science est en plein développement et les sociétés savantes émergent; les plantes restent au centre des préoccupations des naturalistes (tant pour leur importance économique que comme objet de collection, comme les tulipes); les animaux commencent cependant à être illustrés, comme le célèbre dodo et aussi les coquillages avec des erreurs d'inversion d'ouverture à gauche (la dissymétrie des gastéropodes a fait apparaître ce problème nouveau);
◆ le XVIIIème siècle : c'est l'époque de Buffon et des grands voyages à la surface du globe; réaliser un ouvrage naturaliste illustré reste une entreprise dont la rentabilité est lon d'être assurée et le recours aux financements et aux souscripteurs est presque un passage obligé; la qualité des représentations devient d'un très bon niveau, exigé par les taxonomistes;
◆ le XIXème siècle : les avancées technologiques augementent considérablement les capacités de production des imprimeurs et les prix des impressipons chutent; la paléontologie devient un nouveau centre d'intérêt, tout comme l'exploration des grandes profondeurs marines : l'une et l'autre vont alimenter une abondante iconographie;
◆ le XXème siècle : les professionnels cherchent à comprendre le vivant tandis que les amateurs éclairés accumulent les observations; les nouveaux médias comme la photographie, le cinéma, la télévision et Internet diffusent l'amour de la nature avec des figures emblématiques comme Sir David Attenborough.

Un splendide voyage au sein de la nature et de l'histoire !

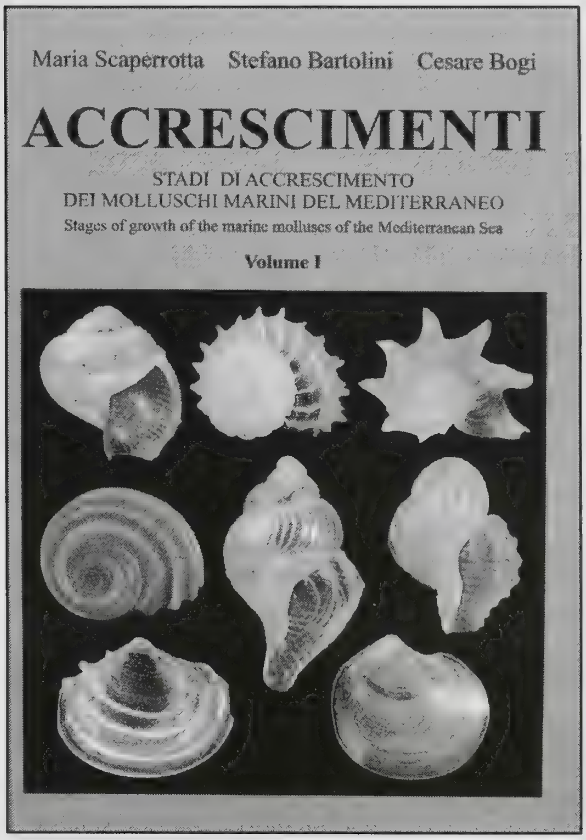
Claude Vilvens

ACCRESCIMENTI
STADE DI ACCRESCIMENTO DEI MOLLUSCHI MARINI DEL MEDITERRANEO (STAGES OF GROWTH OF THE MARINE MOLLUSCS OF THE MEDITERRANEAN SEA)
VOLUME I

par **Maria Scaperrotta, Stefano Bartolini & Cesare Bogi**

pp. 1-167, nombreuses photographies couleurs/bilingue italien-anglais.
Format 215 x 300 mm, couverture rigide.
Prix : 60 euros + frais d'envoi.

L'Informatore Picano.
malacologia@fasnet.it
http://www.malacologia.it



Maria Scaperrotta Stefano Bartolini Cesare Bogi

ACCRESCIMENTI

STADI DI ACCRESCIMENTO
DEI MOLLUSCHI MARINI DEL MEDITERRANEO
Stages of growth of the marine molluscs of the Mediterranean Sea

Volume I

Les auteurs illustrent et ne commentent pas moins de 122 espèces, de la forme juvénile à la forme adulte, variant parfois de 1,5 mm (juvénile) à 100 mm (adulte) pour *Spondylus gaederopus* (Linné, 1758), de 0,6 à 25 mm pour *Spisula subtruncata* (Da Costa, 1778), de 0,75 mm à 33 mm pour *Cypraea lurida* Linné, 1758 ou de 11 mm à 45 mm pour *Strombus persicus* Swainson, 1821.

Ce livre débute par la présentation du projet, une courte introduction, puis la méthode et le matériel utilisés, quelques explications sur la technique de photographie suivent ensuite, pour se terminer par la liste des espèces étudiées et illustrées, avec mention de la page en italien et de sa traduction en langue anglaise.

Les espèces sont classées de façon systématique, en commençant par les gastéropodes, notamment les Fissurellidae et en se terminant par les Cuspidariidae pour les bivalves; vingt-huit familles de gastéropodes et 25 de bivalves sont illustrées avec une moyenne de une à trois espèces par famille, exception faite pour les Buccinidae (14 espèces), les Arcidae (8 espèces) et les Mytilidae (12 espèces). Chaque espèce est illustrée à l'aide de 3 à 7 photos, parfois à partir de l'embryon jusqu'à l'adulte, permettant ainsi d'observer la progression de la croissance, du stade embryonnaire vers le stade adulte.

Pour chaque espèce les auteurs mentionnent l'habitat, la distribution géographique générale, la provenance des spécimens photographiés, quelques notes sur la coquille (description, couleur, variabilité, etc.) et enfin quelques références essentielles. Les coquilles sont illustrées sur la même page, sur fond noir, avec un grossissement permettant une très bonne identification. Enfin, un index des quelques 122 espèces observées et photographiées clôture cet excellent ouvrage.

Un livre que je conseille vivement à tous les membres, amateurs et professionnels, que la faune méditerranéenne et/ou européenne ne laisse pas indifférent. En un mot comme en cent : il s'agit d'une excellente réalisation qui sera certainement suivie d'autres volumes. A suivre donc !

Roland Houart

2. Une publication électronique

GEORGE BRETTINGHAM SOWERBY I, II, III: THEIR CONCHOLOGICAL PUBLICATIONS AND MOLLUSCAN TAXA

par **Richard E. Petit**

Zootaxa 2189. Monograph, pp. 1-218.
www.mapress.com/zootaxa/list/2009/zt02189.html
Prix: 23,85 USD, en format PDF

Après George Perry et son édition de "Conchology" en 1811 (Zootaxa 377: 1-72) et L. A. Reeve (1814-1865) (Zootaxa 1648: 1-120), voici la génération des Sowerby ! Décidément, comment Dick Petit fait-il pour écrire et compléter ces monographies d'auteurs en aussi peu de temps et de façon si fouillée ? C'est un mystère, mais un bonheur en même temps, car toutes ces réalisations sont une mine de renseignements incontournables.

Trois générations de Sowerby, tous prénommés Georges Brettingham, ont largement contribués à la littérature malacologique et/ou conchyliologique au 19me et 20me siècles. Ils furent florissants du temps où de nombreux voyageurs téméraires commençaient à sillonner le globe.

Le nom "Sowerby" est ambigu dans la littérature car ils furent trois à publier monographies, articles ou autres nouvelles, de 1821 à 1921, respectivement le père, le fils et le petit-fils, connu sous les noms de Sowerby I, Sowerby II et Sowerby III.

La monographie de Richard E. Petit nous guide parmi toutes leurs publications et leurs nombreux taxa. L'article nous offre en outre une bibliographie complète, tandis qu'un total de 4506 taxa nous est fourni, dont 53 du groupe-genre et 3915 du groupe-espèce sont considérés comme valides.

Je vous laisse à la joie de découvrir cette splendide contribution. Rendez-vous sur mapress.com !

Roland Houart

P.S. Un court article fut également publié en son temps par J. Christiaens dans ARION, une publication antérieure de la SBM.

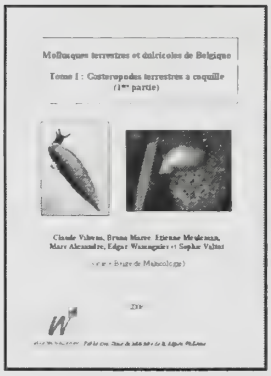
Christiaens, J. 1976. La famille Sowerby. *Arion* 3-4: 1-3.

Toujours disponibles :

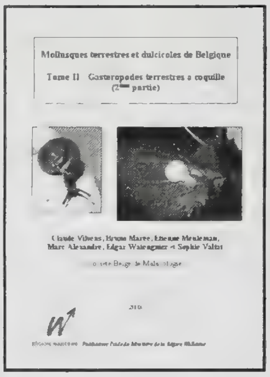
Mollusques terrestres et dulcicoles de Belgique

Tome I : Gastéropodes terrestres à coquille (1ère partie)
Tome II : Gastéropodes terrestres à coquille (2ère partie)
Tome III : Gastéropodes terrestres sans coquille (limaces)
Tome IV : Gastéropodes dulcicoles
Tome V : Bivalves dulcicoles

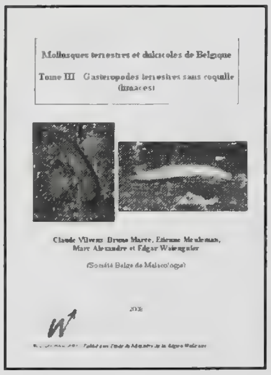
par **Claude Vilvens, Bruno Marée, Etienne Meuleman, Marc Alexandre** et **Edgar Waiengnier**



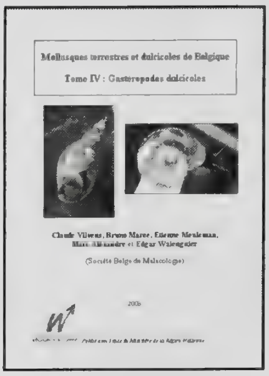
Mollusques terrestres et dulcicoles de Belgique
Tome I : Gasteropodes terrestres a coquille (1ère partie)



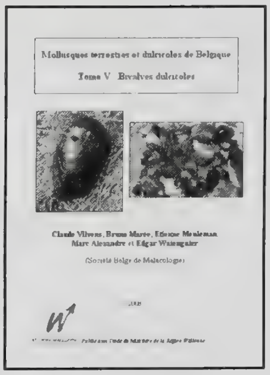
Mollusques terrestres et dulcicoles de Belgique
Tome II Gasteropodes terrestres a coquille (2ème partie)



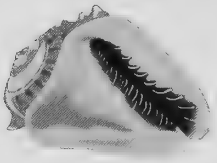
Mollusques terrestres et dulcicoles de Belgique
Tome III Gasteropodes terrestres sans coquille (limaces)



Mollusques terrestres et dulcicoles de Belgique
Tome IV : Gasteropodes dulcicoles
(Société Belge de Malacologie)



Mollusques terrestres et dulcicoles de Belgique
Tome V Bivalves dulcicoles
(Société Belge de Malacologie)



Nous avons reçu

Claude VILVENS

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°249, septembre-octobre 2009

Calendrier des activités 2

Comptes rendus des activités

- Reconnaissance des graminées à Feschaux 4
- Promenade dans la vallée de la Hédrée 5
- Observations ornithologiques à Wiesme (2) 7
- Sortie botanique à Givet 8
- Le jardin aux oiseaux 11
- Après-midi de prospections (malacologique et autres) sur le Tienne de la Roche, à Eprave 12
- Sortie entomologique à Wiesme 13
- Sortie mycologique dans les bois de Famenne 14
- A la recherche des hirondelles de la vallée du Vachau 16
- Sortie d'intérêt général et calcul de l'indice biotique de quelques affluents de l'Our (2) 18
- Sur les traces des animaux... 22

Chroniques de l'environnement

- Un lotissement de 42 maisons sur le Tienne d'Inzéry, à Wellin 25
- Déversement de pesticides à Froidlieu 26

Informations aux membres

- Repas annuel des Natus 27

LES NATURALISTES BELGES

(Belgique)
Vol. 87, N°4, octobre-décembre 2006

DELVOSALLE, L. et des membres de l'IFFB - Atlas floristique de l'IFFB. France NW. N et NE. Belgique – Luxembourg. Extraits de la version CD-rom 2009. 1-18
LAMOTTE, G. - Le retour du phoque veau-marin Phoca vitulina sur la côte belge 19-23
LAMOTTE, G. - L'anguille européenne, Anguilla anguilla, une espèce gravement menacée 24-32

GLORIA MARIS

(Belgique néerlandophone)
Vol. 49, N°2-3, septembre 2009

1. *C.J.M. Krijnen & R.J. Vink*
   The operculum of the genus *Nerita*.
2. *J. Wuyts, N. Severijns, F. Celen & R. Pringels*
   Mollusken uit de streek van Viroinval.

BELGIAN JOURNAL OF ZOOLOGY

(Belgique)
Vol. 139, N° 1, janvier 2009

Des Insectes, Amphibiens, Poissons, Mammifères, Vers, etc mais pas de Mollusques.

BULLETIN DE L'INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE

(Belgique)
Biologie, Vol. 78, 2008

Des Copépodes et des Crustacés … mais pas de Mollusques.

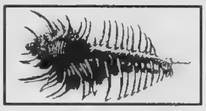
CLUB CONCHYLIA MITTEILUNGEN

(Allemagne-Autriche)
N°12, août 2009

Vorwort des 1. Vorsitzenden 4
Klaus Kittel: Einladung zur Börse und JHV 2009 5
Personalia 5
Aufruf – Call für Support 6
Neuigkeiten aus der Clubbibliothek 6
Errata 6
Wir gratulieren 7
Aus dem Clubleben 7
    Einladung Regionaltreffen Ost 7
    Roland Hoffmann: Regionaltreffen Nord in Cismar 7
    In Memoriam – Richard Metzner 11
    Termine 11
Gunther Trappe: 40 Jahre Club Conchylia 12
    „Historische“ Bilder von CC-Mitgliedern 23
Sigurd-Dieter Hamscher: Bilder von der JHV 1992 BO-Wattenscheid 26
    Bilder von der JHV 1996 Cismar 27
Roland Hoffmann: Die Geschichte der Gattung *Pseudomarginella* 28
Erica Steinegger: Taiwan – Im Land des Drachens 30
Sigurd-Dieter Hamscher: Präsentation von Sammlerstücken auf Börsen 42
Manfred Blöcher: Die Urtriebe des Menschen Sammeln und Jagen (V) 43
Gunther R. Reitz: Paua Paua Ästhetik 56
Udo Koschwitz: Bilder kubanischer Landschnecken 58
Klaus Kittel: Der Junge Schneckensammler (8): Kegelschnecken 59
Presseschau 63
Klaus Kittel, Günter Sterba, Felix Lorenz: Buchbesprechungen 69
Hotel-Verzeichnis Öhringen 76
Club-Händler werben bei Club-Mitgliedern 77

CONCHYLIA

(Allemagne)
N°40 (1-2), août 2009



Inhalt / Contents 1

Nordsieck, H.: Ergänzung der Revision der Gattung *Medora* H. & A. Adams, mit Beschreibungen neuer Taxa (Gastropoda, Stylommatophora, Clausiliidae, Alopiinae) 2

Niederhöfer, H.-J., Falkner, G. & Hanneforth, R: Husmanns Brunnenschnecke *Bythiospeum husmanni* (C. Boettger, 1963). Weichtier des Jahres 2009 12

Egorov, R. V.: The genus *Cyclotus* Guilding in Swainson, 1840: Systematics and nomenclature 16

Kleemann, K.: *Lithodomus bisulcata* Orbigny, 1853, a junior synonym of *Modiola appendicula* Philippi, 1846 23

Çulha, M., Ergen, Z. & Bat, L.: New records for the mollusca fauna of the Black Sea coasts (Sinop Peninsula) of Turkey: *Gibbula adriatica* (Philippi, 1844); *Hydrobia acuta* (Draparnaud, 1805); *Mangelia costata* (Donovan, 1804), (Gastropoda: Trochidae, Hydrobiidae, Conidae) 28

Hanneforth, R. & Westphal, B: *Bythiospeum husmanni* (Boettger, 1963) in Nordrhein-Westfalen eine Ergänzung zum Weichtier des Jahres 2009 33

Kreipl, K. & Eggeling, T.: Remarkable freak-forms of *Phalium bandatum bandatum* (Perry, 1811) (Cassidae: Phaliinae) from Vietnam 43

Herrmann, M. & Dekkers, A. M.: A new species of *Mitra* (Gastropoda: Mitridae) from the Philippines 46

Lorenz, F.: A new species of *Archivolva* from the Red Sea (Gastropoda: Ovulidae) 51

Engl, W.: Ergänzungen zur Publikation der Neubeschreibungen von *Pleurotomella maitasi* Engl, 2008 und *Pleurotomella raineri* Engl, 2008 56

Lorenz, F.: The *Erosaria helvola* species-complex (Gastropoda: Cypraeidae) 57

Hoffmann, R.: Ein weiterer Fund von *Gibberula rolani* Cossignani & Cecalupo, 2005 (Gastropoda, Muricoidea, Cystiscidae) von den Kapverdischen Inseln 63

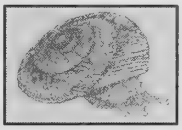
SPIXIANA

(Allemagne)
Vol. 32, N°2, novembre 2009

Des Insectes, quelques Mammifères et Amphibiens, mais pas de Molusques …

SCHRIFTEN ZUR MALAKOZOOLOGIE

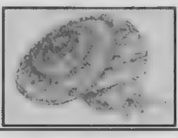
(Allemagne)
Vol. 24, septembre 2009



Hunyadi, A. & Szekeres, M.: *Tsoukatosia subaii* spec. nov. (Gastropoda: Pulmonata: Clausiliidae), a third representative of a relict genus from Greece. 1

Tappert, A.: Die Molluskenfauna von Moskau und der Moskauer Oblast, Russland. 5

SCHRIFTEN ZUR MALAKOZOOLOGIE



(Allemagne)
Vol. 25, septembre 2009

WIESE, V.: Einschleppung einer Banana-slug *Ariolimax columbianus* nach Norddeutschland. 1

FEHER, Z. & ERÖSS, Z. P.: Contribution to the Mollusca fauna of Albania. Results of the field trips of the Hungarian Natural History Museum between 1992 and 2007. 3

FEHÉR, Z. & ERÖSS, Z. P.: Checklist of the Albanian mollusc fauna. 22

DHARMA, B.: A new *Fissidentalium* and report on *Fissidentalium yokoyamai* (MAKIYAMA 1931) from Indonesian waters (Scaphopoda, Dentaliidae: *Fissidentalium*). 39

WIESE, V.: Notiz zum Verhalten von *Helicigona lapicida* (LINNAEUS 1758) in norddeutschen Buchenwäldern. 46

SAHLMANN, B., RICHLING, I. & WIESE, V.: Note on the *Siphonodentalium* Species from Arctic Waters (Mollusca, Scaphopoda). 47

NAGEL, K.-O.: Die Bachmuschel *(Unio crassus)* in der Wied (Westerwald, Rheinland-Pfalz). 53

PFEIFFER, M.: Nachweis von Bachmuscheln (*Unio crassus*) in der Jagst. 57

WIESE, V.: Kurzbericht über das Haus der Natur – Cismar 2004-2009 – anlässlich seines dreißigjährigen Bestehens. 59

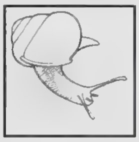
XENOPHORA

(France)
N°128, octobre-décembre 2009

2 Informations AFC et Xenophora
3 Editorial par G. Jaux
4 Le coin du Débutant par G. Jaux
6 Sur les traces d'Adanson
8 Deux *Euthria* de surface des Iles du Cap Vert par J-P. Duboc et S. Pineau
10 Un curieux élevage vendéen par P. Dardart
11 *Agaronia gibbosa* par G. Lhaumet
12 *Conus diminutus* des Iles du Cap Vert par J-P. Duboc et S. Pineau
13 Les types du MNHN par A. Robin
17 En passant par la Normandie ... par A. Robin
18 Identifiez moi !
19 Un tour de Tenerife par S. Guyonneau
24 Observations sur *Conus guanche* par S. Guyonneau
27 Vu sur le Web par B. Mathé
29 Coup de projecteur sur les Neritidae par L. Limpalaer (1ère partie)
34 La famille Triviidae en Méditerranée ou la famille recomposée par J. Pelorce
39 Retour à Praslin par D. Touitou
50 Retour sur l'Ile aux Dragons par E. Steinegger
57 Lu pour vous par R. Houart
58 Courrier des lecteurs
59 Echo...coquillages Petites annonces

BASTERIA

(Pays Bas)
Vol. 73, N° 1-3, octobre 2009



ROLÁN, E., R. FERNÁNDEZ-GARCÉS, & H.G. LEE: The genus *Stosicia* in the Caribbean (Caenogastropoda, Rissoidae), with the description of a new species 1

COSEL, R. VON: The razor shells of the eastern Atlantic, part 2. Pharidae II: the genus *Ensis* Schumacher, 1817 (Bivalvia, Solenoidea) 9

SEVERNS, M.: A new species of *Newcombia* from the Pleistocene of Kaua'i, Hawaiian Islands, USA (Gastropoda, Pulmonata, Achatinellidae) 57

WINTER, A.J. DE, H.J.W.M. CREMERS, & D.M. SOES: The Asian tramp snail *Bradybaena similaris* in a tropical greenhouse in Arnhem, The Netherlands 61

KRONENBERG, G.C.: A note on Bandel's 2007 review of the classification and phylogeny of the Strombidae (Caenogastropoda) 65

BREURE, A.S.H.: Book review 68

MARIOTTINI, P., C. SMIRIGLIO, & A. DI GIULIO: Two new mathildids from the south-eastern coast of Africa (Gastropoda, Heterobranchia, Mathildidae) 69

MAASSEN, W.J.M.: A new *Hemiplecta* species from a remote mountain in south-east Sumatra, Indonesia (Gastropoda, Pulmonata, Ariophantidae) 77

BRUGGEN, A.C. VAN: Repaired damage to a shell of *Mutela alata* (Lea) (Bivalvia, Unionoida) from Lake Malaŵi 81

DHARMA, B., J. GREGO, & M. SZEKERES: Three new species of clausiliids (Gastropoda: Pulmonata: Clausiliidae) from Indonesia 85

HOEKSEMA, D.F.: Boekbespreking 91

GITTENBERGER, E.: Book review 93

Index to volume 72 94

MISCELLANEA MALACOLOGICA

(Pays-Bas)
Vol. 3, N°6, octobre 2009

H. Dekker & A. M. Dekkers. A new species, *Nassarius kooli* n. sp. (Gastropoda: Nassariidae), from deep water in the Philippines and Japan. 117

M. J. Faber. Marine gastropods from the ABC-islands and other localities 29. The genus *Arene* with the description of a new species (Gastropoda: Turbinidae). 121

Additions and corrections. 126

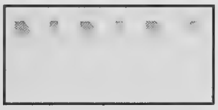
M. J. Faber. Marine gastropods from the ABC-islands and other localities 30. A new rissoiform genus and species (Gastropoda: Rissooidea). 127

M. J. Faber. Marine gastropods from the ABC-islands and other localities 31. The family Janthinidae. 130

Index. 131

ZOOLOGISCHEN MEDEDELINGEN

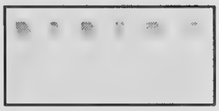
(Pays-Bas)
Vol. 83, N°1, février 2009



Uniquement des Poissons.

ZOOLOGISCHEN MEDEDELINGEN

(Pays-Bas)
Vol. 83, N°2, mai 2009



Uniquement des Insectes (Orthoptères).

SPIRULA

(Pays-Bas)
N° 368, mai-juin 2009

Bestuursmededelingen	Nieuwe secretaris	49
	Excursies 2de helft 2009	49
	Jubileumviering 75 jaar NMV 21 november 2009	49
	Actie-excursie Appingedam	49, 88
	Onderscheidingen	49
	Programma NMV-bijeenkomst zaterdag 26 september 2009	50
A.S.H. Breure	Dr. A.C. van Bruggen - 80 jaar	50
A.C. van Bruggen	In memoriam Professor Al Mead, 1913-2009	51
-	Koninklijke onderscheiding voor 90-jarige tekenaar van fossiele Schelpen	53
S.J. van Leeuwen, A.W. Gmelig Meyling & A. Boesveld	Natura 2000: beschermde gebieden voor slakken	53
H.J. Raad	Het voorkomen van Basters drijfslak op Tholen	56
R. van den Bos	Mijlpaal: in november 2008 bestond de "kleine schelpengroep Rotterdam"60 jaar	59
B. Kokshoorn	Oude raadsels en nieuwe puzzels in de systematiek van de Chondrinidae (Gastropoda, Pulmonata, Orthurethra)	59
C.M. Neckheim	Verschillen tussen *Candidula intersecta* (Poiret, 1801) en *Candidula gigaxii* (L. Pfeiffer, 1847)	62
J. van Someren	Zeemuseum Miramar	66
C.J.P.J. Margry	Vondst van een linksgedraaide *Arianta arbustorum* en wederom de naam "slakkenkoning"	67
A.S.H. Breure	Slakken als veelvraat: een experiment met een onverwacht resultaat	71
A. Bij de Vaate & E.A. Jansen	De verspreiding van de quaggamossel in de rijkswateren	72
A.S.H. Breure	Landslakken uit Suriname: een nieuwe start in een oude traditie	75
E.A. Jansen	*Gyraulus parvus* (Say, 1817), een nieuwe soort voor de Nederlandse Fauna	77
R.A. Bank	Nieuw beschreven continentale molluskensoorten – (new taxa: continental molluscs)	79
R.A. Bank	Artikelen in tijdschriften - (journal papers: continental malacology)	80
R.A. Bank	Nieuwe boeken - new books	87

SPIRULA

(Pays-Bas)
N° 369, juillet-août 2009

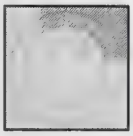
	Voorplaat	89
Diverse bronnen	Malacologische agenda - 2009	89
Bestuur	Programma NMV 75 jaar	89
Titselaar. F. & A.van Peursen	Beste leden van de NMV	90-91
Diverse bronnen	Excursies - 2009	91
Rijken, R.	*Mercenaria mercenaria* (Linnaeus, 1758), levend verzameld op de slikken van Viane	92-97
Linden. J. van der. J.C.A Eikenboom & H.P.M.G. Menkhorst	*Helix glabrata* Von Mühlfeldt, 1824 (Gastropoda, Rissoidae ? Pyramellidae ?). Schier ultieme verwarring	98-103
Titselaar. F.F.L.M.	De Tapijtschelpen van Zeeland en de Zuid-Hollandse eilanden	103-106
Faber. W.	Nieuwe weekdiersoorten (schelpen)	107-108
Faber, W.	Tijdschriftartikelen	108-113
Faber. W.	Nieuwe boeken	113-114
Faber. W. & T.M. Walker	Weekdieren op postzegels	115
Diverse bronnen	Internationale Schelpenbeurzen en bijeenkomsten	116

SPIRULA

(Pays-Bas)
2009

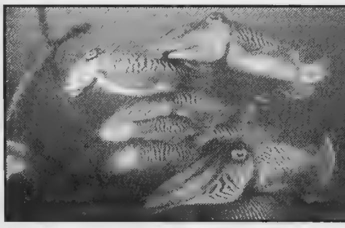
Numéro spécial consacré aux 75 ans de la Société Néérlandaise de Malacologie (1934-2009).

HET ZEEPARD



(Pays-Bas)
Vol 69, N°3, mai 2009

J. & F. Stalenburg Voorwoord 66
F.A. Perk Het Sepia-project van Felice en Joop Stalenburg 68
F.A. Perk Waar komt die naam vandaan? 72
J. Verkuil Systematiek en beschrijving van de gewone zeekat *Sepia officinalis* L., 1758 74
R. de Ruijter CS-verslag 80
M.J. Otten SWGroep Waterweg Noord: excursies 2009 86
G. Heerebout Inktvissen in de fuik 87
M. Bilius Ecologie van de zeekat 90
F. Beekman Onbekende tekeningen van *Sepia officinalis* door Jan Joost ter Pelkwijk 105



MALACOLOGIA – Mostra mondiale Cupra Maritima

(Italie)
N°65, octobre 2009
(pas de table des matières malgré le nombre impressionnant de nouvelles espèces décrites ☹ …)

Marginella himburgae n. sp. (Massier & Zetler), *Conus alainallaryi* (Bozzetti & Monnier), *Vitularia triangularis* (Bozzetti), *Epitonium vivens & E. latum* (Bozzetti), *Marginella susanae* (Veldsman & Jooste), *Prunum mariateresae* (T.Cossignani), *Cystiscus mainardii* (T.Cossignani), *Hydroginella roselineae* (T.Cossignani), *Erato edentula & E. inhanbanensis* (Bozzetti).

MALACOLOGICAL REVIEW

(U.S.A. – Michigan)
Vol. 37-40, 2006-2007

Research Articles

Ecological studies of *Bithynia siamensis goniomphalos*, a snail intermediate host of *Opisthorchis viverrini*, in Khon Kaen Province, northeast Thailand.
C. LOHACHIT 1

Biosystématique des mollusques d'eau douce d'intérêt médical et vétérinaire de Cuba.
M. YONG CONG 27

Miscellanea

Original descriptions of North American (north of Mexico) freshwater limpets (Gastropoda: Basommatophora).
J.B. BURCH 119

Contents of Current Serial Publications on Mollusks 163

JOURNAL OF CONCHOLOGY

(Grande-Bretagne)
Vol. 40, N°1, octobre 2009

Urra J & Gofas S New records of *Bela powisiana* (Dautzenberg 1887) (Gastropoda: Conidae) in southern Europe 1

Mariottini P, Smriglio C, Di Giulio A & Oliverio M A new fossil Conoidean from the Pliocene of Italy, with comments on the *Bela menkhorsti* complex (Gastropoda: Conidae) 5

Hausdorf B & Páll-Gergely B *Monacha oecali* new species from southern Turkey (Gastropoda: Hygromiidae) 15

Kadolsky D *Turbo bidens* Linnaeus 1758 (Gastropoda: Clausiliidae) misidentified for 250 years 19

Yanes Y, Martín J, Artiles M, Moro L, Alonso MR & Ibáñez M Rediscovery and rediscription of an almost unknown *Hemicycla* species (Gastropoda: Pulmonata, Helicidae): *H. eurythyra* O. Boettger 1908 from Tenerife, Canary Islands 31

Edmunds M Opisthobranchiate mollusca from Ghana: Goniodorididae 37

Wronski T & Hausdorf B *Oreohomorus apio* new species from Uganda (Gastropoda: Subulinidae) 55

Vavrová L', Horsák M, Šteffek J & Čejka T Ecology, distribution and conservation of *Vertigo* species of European importance in Slovakia 61

Páll-Gergely B Revision of the Turkish *Ramusculus* taxa with description of *Ayna* gen. nov. (Gastropoda: Pulmonata: Enidae) 73

Kozlowski J & Kozłowska M Palatability and consumption of 95 species of herbaceous plants and oilseed rape for *Arion lusitanicus* Mabille 1868 79

Wu M & Wu Q A study of the type species of *Clausiliopsis* Möllendorff (Gastropoda, Stylommatophora: Enidae), with the description of a new species 91

Mifsud C Two new species of *Mitromorpha* Carpenter 1865 from the western Atlantic (Conoidea: Mitromorphinae) 99

COMMUNICATIONS

Reise H & Hutchinson JMC An earlier record of the slug *Selenochlamys ysbryda* Rowson & Symondson, from Brecon, UK 103

Preece RC Land snails from Britain's most northerly natural woodland 105

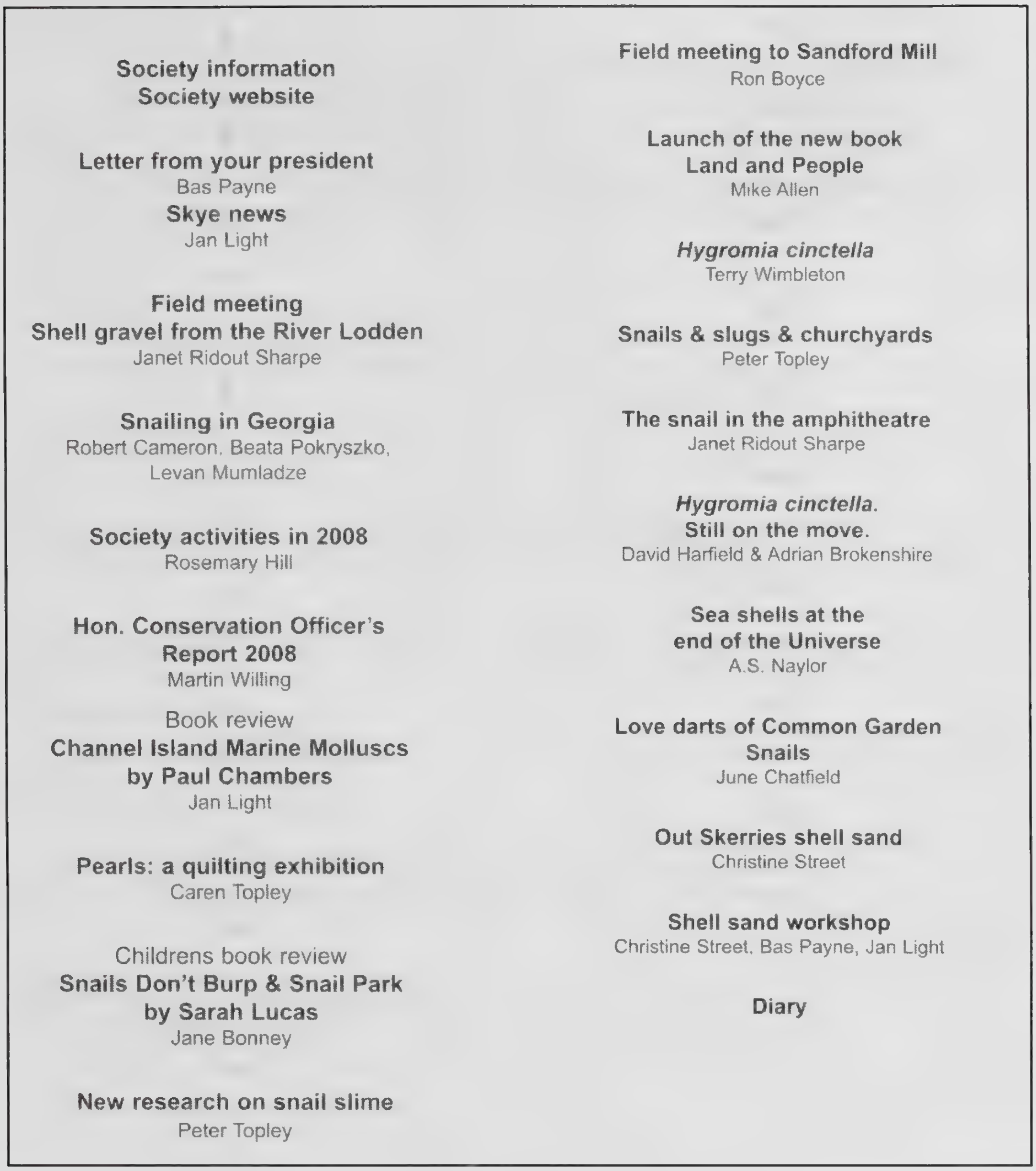
BOOK REVIEWS 107

OBITUARY 111

INDEX TO VOLUME 39 113

MOLLUSC WORLD

(Grande-Bretagne)
N°21, novembre 2009



Society information
Society website

Letter from your president
Bas Payne

Skye news
Jan Light

Field meeting
Shell gravel from the River Lodden
Janet Ridout Sharpe

Snailing in Georgia
Robert Cameron. Beata Pokryszko,
Levan Mumladze

Society activities in 2008
Rosemary Hill

Hon. Conservation Officer's
Report 2008
Martin Willing

Book review
Channel Island Marine Molluscs
by Paul Chambers
Jan Light

Pearls: a quilting exhibition
Caren Topley

Childrens book review
Snails Don't Burp & Snail Park
by Sarah Lucas
Jane Bonney

New research on snail slime
Peter Topley

Field meeting to Sandford Mill
Ron Boyce

Launch of the new book
Land and People
Mike Allen

Hygromia cinctella
Terry Wimbleton

Snails & slugs & churchyards
Peter Topley

The snail in the amphitheatre
Janet Ridout Sharpe

Hygromia cinctella.
Still on the move.
David Harfield & Adrian Brokenshire

Sea shells at the
end of the Universe
A.S. Naylor

Love darts of Common Garden
Snails
June Chatfield

Out Skerries shell sand
Christine Street

Shell sand workshop
Christine Street. Bas Payne, Jan Light

Diary

ANNALS OF CARNEGIE MUSEUM

(U.S.A. – Pennsylvanie)
Vol. 78, N° 2, mai 2009

Des Coléoptères, mais pas de Mollusques …

THE NAUTILUS

(U.S.A.)
Vol. 123, N°3, septembre 2009

PROCEEDINGS OF THE SYMPOSIUM "NEOGASTROPOD ORIGINS, PHYLOGENY, EVOLUTIONARY PATHWAYS AND MECHANISMS" HELD DURING THE 2007 WORLD CONGRESS OF MALACOLOGY, ANTWERP, BELGIUM, 15–20 JULY 2007

GUEST EDITORS M.G. HARASEWYCH AND ELLEN E. STRONG

M.G. Harasewych **Ellen E. Strong**	Preface	71
Yuri I. Kantor **Alexander Fedosov**	Morphology and development of the valve of Leiblein: Possible evidence for paraphyly of the Neogastropoda	73
Alisa R. Kosyan **Yuri I. Kantor**	Phylogenetic analysis of the subfamily Colinae (Neogastropoda: Buccinidae) based on morphological characters	83
Alisa R. Kosyan **Maria Vittoria Modica** **Marco Oliverio**	The anatomy and relationships of *Troschelia* (Neogastropoda: Buccinidae): New evidence for a closer fasciolariid-buccinid relationship?	95
Marco Taviani **Lorenzo Angeletti** **Mark Dimech** **Constantine Mifsud** **André Freiwald** **M.G. Harasewych** **Marco Oliverio**	Coralliophilinae (Gastropoda: Muricidae) associated with deep-water coral banks in the Mediterranean	106
Marco Oliverio **Andrea Barco** **Alexandra Richter** **Maria Vittoria Modica**	The coralliophiline (Gastropoda: Muricidae) radiation: Repeated colonizations of the deep sea?	113
Gregory S. Herbert **Gregory P. Dietl** **Helena Fortunato** **Luiz Ricardo L. Simone** **Jennifer Sliko**	Extremely slow feeding in a tropical drilling ectoparasite, *Vitularia salebrosa* (King and Broderip, 1832) (Gastropoda: Muricidae), on molluscan hosts from Pacific Panama	121
Luiz Ricardo L. Simone **Gregory S. Herbert** **Didier Merle**	Unusual anatomy of the ectoparasitic muricid *Vitularia salebrosa* (King and Broderip, 1832) (Neogastropoda: Muricidae) from the Pacific coast of Panama	137
Chantel Westley **Kirsten Benkendorff**	The distribution of precursors and biosynthetic enzymes required for Tyrian purple genesis in the hypobranchial gland, gonoduct, and egg masses of *Dicathais orbita* (Gmelin, 1791) (Neogastropoda: Muricidae)	148
Patrick W. Laffy **Kirsten Benkendorff** **Catherine A. Abbott**	Trends in molluscan gene sequence similarity: An observation from genes expressed within the hypobranchial gland of *Dicathais orbita* (Gmelin, 1791) (Neogastropoda: Muricidae)	154
Gregorio Bigatti **Carlos J.M. Sanchez Antelo** **Patricia Miloslavich** **Pablo E. Penchaszadeh**	Feeding behavior of *Adelomelon ancilla* (Lightfoot, 1786): A predatory neogastropod (Gastropoda: Volutidae) in Patagonian benthic communities	159

Juliana Giménez
Florencia Arrighetti
Valeria Teso
Gladys N. Hermida
Soledad Zabala
Pablo E. Penchaszadeh
Sperm morphology of two marine neogastropods from the southwestern Atlantic Ocean (Caenogastropoda: Volutidae and Olividae) ... 166

Pablo E. Penchaszadeh
María Eugenia Segade
Spawn characteristics in *Adelomelon ferussacii* (Donovan, 1824) (Gastropoda: Volutidae) from southern Patagonia, Argentina ... 172

Maria Vittoria Modica
Alisa R. Kosyan
Marco Oliverio
The relationships of the enigmatic gastropod *Tritonoharpa* (Neogastropoda): New data on early neogastropod evolution? ... 177

Guido Pastorino
The genus *Olivella* Swainson, 1831 (Gastropoda: Olividae) in Argentine waters ... 189

Nicolas Puillandre
S. Samadi
M.-C. Boisselier
C. Cruaud
Philippe Bouchet
Molecular data provide new insights on the phylogeny of the Conoidea (Neogastropoda) ... 202

Rosemary E. Golding
Proboscis and foregut morphology of *Ficus subintermedia* (d'Orbigny, 1852) (Caenogastropoda: Ficidae) ... 211

THE FESTIVUS
(U.S.A. – Californie)
Vol. XLI, N°8, août 2009

Club news ... 114
Report of the WSM meeting - 2009
JULES HERTZ ... 115
A note on the opisthobranch molllusks of Rocas Alijos
ALICIA HERMOSILLO ... 118

THE FESTIVUS
(U.S.A. – Californie)
Vol. XLI, N°9, septembre 2009

Club news ... 122
Correction to Hermosillo (2009) ... 122
Diving and Shell Collecting in New Zealand's Marlborough Sound
KATHY KALOHI ... 123
ERRATA [Corrections and changes to Stebbins, T.D. and D.J. Eernisse, 2009]
TIMOTHY STEBBINS ... 128

THE FESTIVUS
(U.S.A. – Californie)
Vol. XLI, N°10, octobre 2009

Club news ... 130
Mission Bay Survey Update
PAUL TUSKES ... 131
In Memoriam James Willard Nybakken (1936-2009)
GARY R. MCDONALD ... 133

THE FESTIVUS

(U.S.A. – Californie)
Vol. XLI, N°11, novembre 2009

Club news 140
A new look at *Cymatium (Turritriton) gibbosum* (Broderip, 1833)
CAROLE M. HERTZ & BARBARA W. MYERS 141

TRITON

(Israël)
N°20, septembre 2009

1. MARINE MOLLUSCS

Heiman, E.L. & Mienis, H.K. — ***CASMARIA ERINACEA ERINACEA*** **IN THE GULF OF AQABA.......................** 1
Heiman, E.L. & Mienis, H.K. — **SHELLS OF EAST SINAI, AN ILLUSTRATED LIST. OSTREIDAE.................** 2
Yokes, M.B. — **ADDITIONS TO THE KNOWLEDGE OF OPISTHOBRANCHIA FROM TURKEY..........................** 5
Mifsud,C. & D.P. Cilia — **ON THE PRESENCE OF A COLONY OF *BRACHIDONTES PHARAONIS* (P. FISCHER, 1870) (BIVALVIA: MYTILIDAE) IN MALTESE WATERS (CENTRAL MEDITERRANEAN)..........................** 20
Heiman, E.L. & Yerenburg, V. — **THE SHELL SIZE OF TWO LESSEPSIAN MIGRANTS *THAIS LACERA* AND *THAIS SACELLUM* ....** 23

2. COWRIES: INTRASPECIFIC VARIATION, NEW INFORMATION

Heiman, E.L.
ABOUT *EROSARIA TURDUS* LIVING IN THE MEDITERRANEAN SEA.......... 24
A "SPECIES FIRST RULE": AN IMPORTANT CRITERION OF SUBSPECIES... 25
A HYPOTHESIS: *C. GASKOINI* (REEVE, 1846) SHOULD PERHAPS BE TREATED AS A SUBSPECIES OF *C. CRIBRARIA* (LINNAEUS, 1758) 26
CRIBRARULA FISCHERI **(VAYSSIERE, 1910), A SYNONYM OF *CRIBRARULA CRIBRARIA* (LINNAEUS, 1758)..........................** 27
VAYSSIÈRE-SCHILDER (V-S) FORMULA FOR COMPARING COWRY POPULATIONS.......................... 28

3. LANDSNAILS AND FRESHWATER MOLLUSCS

Gümüş B. A. — **WHAT IS HIDDEN IN THE MONASTERY OF SÜMELA, TRABZON, TURKEY? ....** 30

4. NEWS, NEW FINDS, NEW BOOKS

Inchaustegui, J. — **SO, WHAT'S FOR DINNER? ....** 35
Heiman, E.L. — **NEW BOOK: "Registry of world record size shells" 6th edition..........................** 36

IMPORTANT INFORMATION—TRITON 20 SUPPLEMENTS (free pdf files):

1. Heiman, E.L. ***CRIBRARIA FISCHERI*** **VAYSSIERE, 1910, A SYNONYM OF *CRIBRARULA CRIBRARIA* (LINNAEUS, 1758): ITS NOMENCLATURAL HISTORY AND A COMPARATIVE STUDY OF SHELL CHARACTERS**
2. Heiman, E.L. ***CRIBRARULA GASKOINI*** **(REEVE, 1846), AN INTERESTING FORM, WHICH CAN PERHAPS BE TREATED AS A SUBSPECIES OF *C. CRIBRARIA* (LINNAEUS, 1758)**

MOLLUSCAN RESEARCH

(Australie)
Vol. 29, N°3, septembre 2009

121 **Exploring a largely unknown fauna: On the diversity of pachychilid freshwater gastropods in Vietnam (Caenogastropoda: Cerithioidea)**
FRANK KÖHLER, MANDË HOLFORD, DO VAN TU & HO THANH HAI

147 **The New Zealand chitons *Ischnochiton luteoroseus* Suter, 1907 and *Ischnochiton granulifer* Thiele, 1909 (Mollusca: Polyplacophora)**
BRUNO ANSEEUW, BRUCE A. MARSHALL & YVES TERRYN

155 **The Recent Coralliophilinae of the New Zealand region, with descriptions of two new species(Gastropoda: Neogastropoda: Muricidae)**
BRUCE A. MARSHALL & MARCO OLIVERIO

174 **Expansion of an invasive freshwater snail *Physa acuta* (Gastropoda: Physidae) in China**
YUNHAI GUO, CHUNG-CHI HWANG & HONGXUAN HE

179 **mRNA expression of antioxidant enzymes and physiological responses in the Pacific oyster, *Crassostrea gigas*, exposed to an hypoxic environment**
MI SEON PARK, PIL GUE JO, KWANG WOOK AN, SUNG HWOAN CHO, GYUNG-SUK KIL TAE-SEOK MOON & CHEOL YOUNG CHOI

184 **Index of authors and new taxa in volume 29 (2009)**

KEPPEL BAY TIDINGS

(Australie – Queensland)
Vol. 48, N° 1, mars-mai 2009

- E. RAYMONT : Ling island – A southern paradise
- J. OFFORD : Our visit to Cairns
- J. SINGLETON : Morelet's Cone
- E. COUCOM : Auckland Shell Show 2009
- Diverses notes, annonces, comptes-rendus, etc

KEPPEL BAY TIDINGS

(Australie – Queensland)
Vol. 48, N° 2, juin-août 2009

- Shell Show 2009
- T. WHITEHEAD : Bivalve foreigners in Australia
- B. O'BRIEN : Coffs and cold again
- E. COUCOM : More Cymbiolas
- Diverses notes, annonces, comptes-rendus, etc

KEPPEL BAY TIDINGS

(Australie – Queensland)
Vol. 48, N° 3, septembre-novembre 2009

- Venus flower basket – Optical fibres from nature
- A. LIMPUS: A recent cause for excitement.
- J. SINGLETON: Scullett's cone.
- E. COUCOM : Continuing the Cymbiolas
- Diverses notes, annonces, comptes-rendus, etc

RECORDS OF THE AUSTRALIAN MUSEUM

(Australie)
Vol. 61, N°1, mai 2009

Des Insectes, des Cristacés et divers fossiles … mais pas de mollusques.

AMERICAN CONCHOLOGIST

(U.S.A. Sud-Est)
Vol. 37, N° 3, septembre 2009

Editor's Comments -- 3

Notocypraea: Shell collecting and Science By Don Cram ------ 4

John W. Kline, Pioneer American Shell Dealer
By Bill Michal -- 11

Dealer Directory -- 14

Marine Shells of Northeast Florida: A Chronicle of the
Campaign By Harry G. Lee -- 18

Book Review: Marine Shells of Northeast Florida ------------ 21

Book Review: Clams, Oysters, & Scallops --------------------- 22

Book Review: Seashells On My Mind --------------------------- 22

Book Review: Encyclopedia of Marine Gastropods ----------- 23

Mollusks in Wonderland: The Pelecypoda-Bivalvia Dilemma
By Cléo Dilnei de Castro Olivera -------------------------------- 24

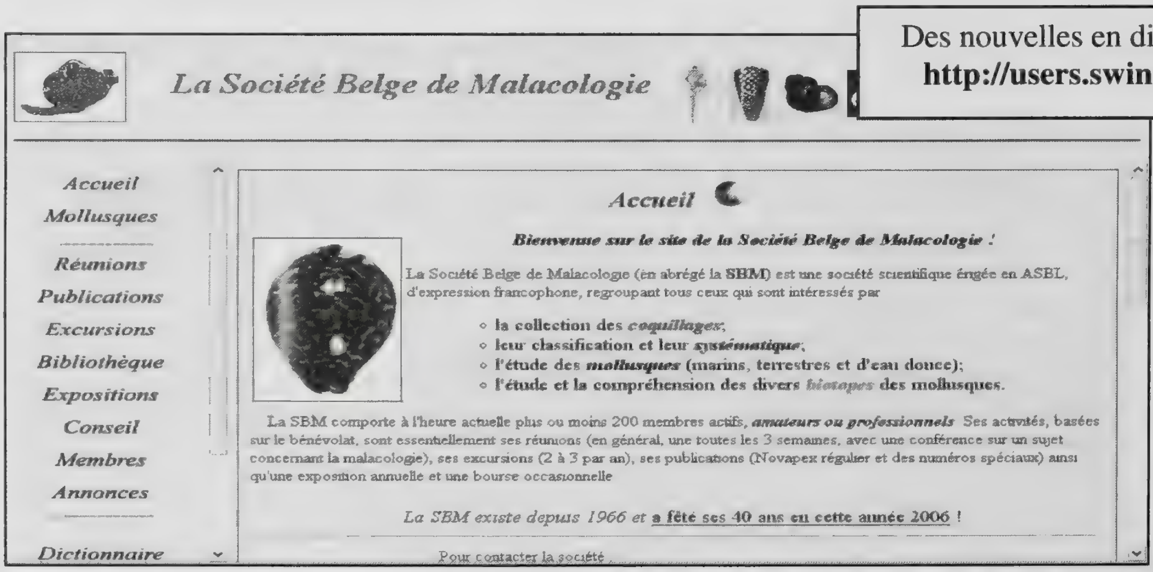
In Memoriam -- 27

Cypraea (Eclogavena) dayritiana – Dayrit's Cowry
By Charles E. Rawlings, M.D., J.D. ---------------------------- 28

End of a Voyage By Bob Pierson ---------------------------------30

Shell-abration Boston: COA 2010 ------------------------------- 34

Des nouvelles en direct de la SBM ?
http://users.swing.be/sw216502



Bienvenue sur le site de la Société Belge de Malacologie !

La Société Belge de Malacologie (en abrégé la **SBM**) est une société scientifique érigée en ASBL, d'expression francophone, regroupant tous ceux qui sont intéressés par

- **la collection des *coquillages*,**
- **leur classification et leur *systématique*,**
- **l'étude des *mollusques* (marins, terrestres et d'eau douce);**
- **l'étude et la compréhension des divers *biotopes* des mollusques.**

La SBM comporte à l'heure actuelle plus ou moins 200 membres actifs, ***amateurs ou professionnels*** Ses activités, basées sur le bénévolat, sont essentiellement ses réunions (en général, une toutes les 3 semaines, avec une conférence sur un sujet concernant la malacologie), ses excursions (2 à 3 par an), ses publications (Novapex régulier et des numéros spéciaux) ainsi qu'une exposition annuelle et une bourse occasionnelle

La SBM existe depuis 1966 et **a fêté ses 40 ans en cette année 2006** !

Pour contacter la société

VENUS

(Japon)
Vol. 68, N° 1-2, septembre 2009

Original Articles

Paul Callomon, Martin Avery Snyder and Ronald G. Noseworthy: A new species of *Fusinus* from Korea (Gastropoda: Fasciolariidae) ········ 1

Iwao Hamatani: A new species of *Enotepteron* (Gastropoda: Opisthobranchia: Gastropteridae) from off Niigata Prefecture, in the Sea of Japan ········ 9

Takashi Okutani, Takeru Koshi-ishi, Takako Sato, Takeo Imai and Chiaki Kato: Vesicomyid fauna in the Chishima (Kurile) Trench: Occurrences of a new taxon and *Calyptogena extenta* ········ 15

Yoshihiro Fujiwara, Takashi Okutani, Toshiro Yamanaka, Masaru Kawato, Chitoshi Mizota, Katsunori Fujikura, Tomoko Yamamoto and Kenji Okoshi: *Solemya pervernicosa* lives in sediment underneath submerged whale carcasses: Its biological significance ········ 27

Suguru Ujino and Akihiko Matsukuma: Trends in life orientations of nine infaunal bivalve species based on quantitative measurement data ········ 39

Shun Kobayashi, Masako Izawa and Tetsuo Denda: Pollen Feeding Behavior of *Acusta despecta despecta* (Pulmonata: Bradybaenidae) ········ 55

Short Notes

Mitsuo Chino: A new species of the genus *Cornisepta* McLean, 1988 (Gastropoda: Fissurellidae) from Japan ········ 63

Takeharu Kosuge: Occurrence of the montacutid bivalve *Barrimysia siphonosomae* in Nagura Bay, Ishigaki Island, the Ryukyu Islands, as a new record from Japan ········ 67

Takashi Kuramochi: Growth of *Olivella fulgurata* (Gastropoda: Olividae) in Sagami Bay, Miura Peninsula, central Japan ········ 71

Proceedings

Abstracts of papers presented at the 2009 annual meeting of the Malacological Society of Japan (Osaka) ········ 75

THE KOREAN JOURNAL OF MALACOLOGY

(Corée)
Vol 23, N° 2, décembre 2007

한국패류학회지

Au milieu des articles de biochimie, relevons :

1 **Report on Unknown Form, hitherto, of the *Genus Octopus* from Eastern Coast of Korea**
손민호, 김미향

5 **Genetic Variability between Ark Shell (*Scapharca subcrenata*, Lischke) Populations from Daecheon and Wonsan**

51 **Review of the Shell-bearing Gastropods in the Russian Waters of the East Sea (Sea of Japan). III. Caenogastropoda: Neogastropoda**
V.V. Gulbin

71 **Review of the Shell-bearing Gastropods in the Russian Waters of the East Sea (Sea of Japan). IV. Heterobranchia**
Vladimir V. Gulbin, Elena M. Chaban

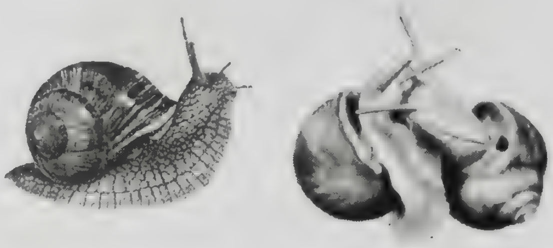
FERNAND & RIKA DE DONDER
Melsbroeksestraat 21
1800 Vilvoorde - Peutie
BELGIUM
Tel : +32 (0)2 253 99 54
Fax : +32 (0)2 252 37 15
e-mail : fernand.de.donder@pandora.be

WORLDWIDE SPECIMEN SHELLS

10 Minutes from Brussels Airport. Visitors welcome.

All Families from the very common to the ultra rare, specialized in Pectinidae, Philippine shells and European shells.

Free list on request, good quality shells at the best prices. Satisfaction guaranteed !



SOCIEDAD ESPAÑOLA DE MALACOLOGIA
S.E.M.

Museo Nacional de Ciencias Naturales
José Gutiérrez Abascal, 2
28006 MADRID

SEM (Sociedad Española de Malacologia) is a scientic society devoted to the study of molluscs.

Every year the memberships receive the following publications:

2 issues of IBERUS
1 issue of RESEÑAS MALACOLOGICAS
2-3 issues of NOTICIARIO DE LA SEM

some years, 1 extra IBERUS from a Congress or as a supplement.

You can be membership of the SEM by 7.000 ptas by year, plus an unique inscription fee of 1.000 ptas.

Please, ask for the inscription print paper.

CONCHOLOGIST

Calendar membership (Jan - Dec) = $25 (USA)
Postal surcharges: + $5 for USA first class,
Canada & Mexico + $5, other nations + $15
New members apply to Doris Underwood, Membership Director
698 Sheridan Woods Drive
W. Melbourne, FL 32904-3302
USA
dunderwood1@cfl.rr.com

Quarterly Journal of the Conchologists of America, Inc.

XENOPHORA
Bulletin de l'Association Française de Conchyliologie

2003 Yearly Subscription Rate
France - Europe - DOM TOM : 45 €
Other countries : 55 €
Visit our site : www.xenophora.fr.st

afc BP 307 F-75770 Paris Cedex 16

The Strandloper
BULLETIN OF THE CONCHOLOGICAL SOCIETY OF SOUTHERN AFRICA

The quarterly bulletin of the Conchological Society of Southern Africa contains reviews and discussion of Southern African marine and non-marine shells, and information about shell collecting in the region. Membership of the Society is US$25 per year.

Please contact
The Conchological Society of S.A.
7 Jan Booysen Str.
Annlin 0182 Pretoria
South Africa
or
email **mikec@msinfo.mintek.ac.za**

Nederlandse
Malacologische
Vereniging

Dutch Malacological Society

Our society warmly welcomes new members (both from the Netherlands and abroad) to participate in our activities:

- **the journals (Basteria and Correspondentieblad)**
- **the meetings (usually 3-4 per year)**
- **the Internet website**
- **the library**
- **the collecting excursions**

Join us and meet new shelling friends. Further info: Bram Breure, Van Schagenplantsoen 8, NL-2741 EN Waddinxveen, The Netherlands. E-mail: abreure@xs4all.nl

Club Conchylia e.V.
German Shell Collector's Club

Our journals:

Informationen
Mitteilungen
Acta Conchyliorum

Yearly subscription rate: 40.- €

Visit our site:

www.club-conchylia.de

Further informations:

Klaus Kittel
Sonnenrain 10
D-97859 Wiesthal
e-mail: klaus_kittel@hotmail.com

GLORIA MARIS

A magazine dedicated to the study of shells.

Edited by the Belgian Society for Conchology, organizers of the Belgium Shellshow

Subscription: Belgium: € 30 - The Netherlands: € 33
Other countries: € 40

Members account manager: J. Wuyts Koningsarendlaan 82 B 2100 Belgium
tel.: 32 3 324 99 14 e-mail: wuyts.jean@ scarlet.be

Si vous passez commande chez l'un de nos annonceurs, n'oubliez pas de préciser que vous avez trouvé son annonce dans Novapex/Société !!!

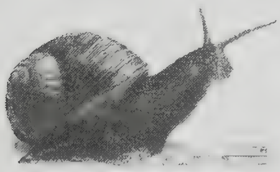
TRITON

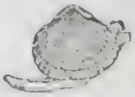
Journal of the Israel Malacological Society

ISSN 1565-1916
Published twice a year since 2000
Yearly subscription rate 20 €

Further information:
Eduard Heiman
e-mail: heimel@netvision.net.il

Keppel Bay Tidings
A quarterly magazine dedicated to the study of shells.
Edited by the Keppel Bay Shell Club Inc.
Subscription:- $20.00 Aus.
Apply to:- Keppel Bay Shell Club Inc.
P.O. Box 5166
Central Queensland Mail Centre, 4702
Queensland,Australia.





Grandes marées de l'année 2010

Christiane DELONGUEVILLE et Roland SCAILLET

Bonne nouvelle ! 2010 est un grand cru. Les plus grandes marées avec un coefficient de 116 auront lieu le 2 mars et le 10 septembre. Ne les ratez surtout pas ! D'autres marées de coefficient supérieur à 110 auront également lieu début février, fin mars, en octobre et même en pleines vacances à la mi-août. Bref de quoi satisfaire les amateurs de pêche à pied et d'observation de la faune de l'estran.

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Samedi 2	(99) - 101
	Dimanche 3	101 - 101
	Samedi 30	(97) - 103
	Dimanche 31	108 - 111
Février	Lundi 1	112 - 112
	Mardi 2	110 - 106
	Mercredi 3	101 - (94)
	Dimanche 28	102 - 108
Mars	Lundi 1	113 - 115
	Mardi 2	116 - 115
	Mercredi 3	113 - 108
	Jeudi 4	102 - (95)
	Lundi 29	101 - 106
	Mardi 30	110 - 112
	Mercredi 31	112 - 110
Avril	Jeudi 1	107 - 103
	Mercredi 28	(99) - 100
	Jeudi 29	100 - (99)
Mai	-	-
Juin	-	-

Juillet	Mardi 13	(98) - 101
	Mercredi 14	102 - 102
	Jeudi 15	100 - (98)
Août	Mardi 10	(98) - 103
	Mercredi 11	108 - 111
	Jeudi 12	112 - 111
	Vendredi 13	109 - 105
	Samedi 14	100 - (93)
Septembre	Mercredi 8	103 - 109
	Jeudi 9	113 - 115
	Vendredi 10	116 - 114
	Samedi 11	111- 106
Octobre	Jeudi 7	103 - 108
	Vendredi 8	111 - 112
	Samedi 9	111 - 109
	Dimanche 10	106 - 100
Novembre	Samedi 6	101 - 101
	Dimanche 7	101 - (99)
Décembre	-	-

Nous réitérons les conseils habituels : Remettez toujours les pierres déplacées en bon ordre. Observez, photographiez et n'échantillonnez que le strict nécessaire. Soyez prudents et renseignez-vous sur les heures des marées à l'endroit où vous vous trouvez. Bonnes marées !

REFERENCE :

Annuaire des Marées pour l'année 2010 - Ports de France - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Paris - 257 p.*

Pointe de l'Arcouest (Côtes d'Armor)

Les données reprises dans cet article peuvent également se retrouver sur notre site Internet :

http://users.swing.be/sw216502/

Mollusks
NOV
5527

NOVAPEX

MCZ
LIBRARY
JUL 08 2010
HARVARD
UNIVERSITY

Trimestriel de la Société Belge de Malacologie
association sans but lucratif
Quarterly of the Belgian Malacological Society

VOL. 11 (2-3) 2010 10 JUIN

SOMMAIRE

Articles originaux – Original articles

T. McCleery Descriptions of eighteen new species in the genus *Granulina* Jousseaume, 1888 (Gastropoda: Cystiscidae) from the Caribbean Sea 37

J. Tröndlé Les Pickworthiidae (Mollusca: Caenogastropoda) de Polynésie française 73

L. G. Brown Description of *Epitonium yangi* n. sp. (Gastropoda: Epitoniidae) from the East China Sea 79

Vie de la Société – Life of the Society

C. Vilvens Prochaines activités 45

C. Vilvens Le projet *Cepaea* de la SBM : la concrétisation 48

C. Delongueville & R. Scaillet Première signalisation de *Ersilia mediterranea* (Monterosato, 1869) sur les côtes de Chypre Nord 49

C. Delongueville & R. Scaillet Première signalisation d'*Atys macandrewii* Smith E.A., 1872 sur les côtes de Chypre Nord 51

(suite du sommaire en dernière page de couverture)

ISSN 1375-7474

Périodique trimestriel
Bureau de dépôt
1370 Jodoigne

RÉGION WALLONNE

Publié avec l'aide du Ministère de la Région Wallonne

COTISATIONS / MEMBERSHIP 2010

Membres résidant en Belgique
(NOVAPEX et les numéros hors série)
Membre effectif .... **40 €**

(sans le service du bulletin)
Personne appartenant à la famille d'un membre effectif et ayant même résidence .... 15 €

Versement à effectuer à la Banque de la Poste, au n° 000-0974225-54 de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret.

Abonnés résidant à l'étranger
(NOVAPEX et les numéros hors série)
Cotisation .... **55 €**

Versement à effectuer auprès de la Banque de la Poste Belge, Bruxelles, au n° 000-0974225-54 [IBAN : BE42000097422554 - BIC : (= SWIFT) BPOTBEB1] de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret **ou** en versant **58 euros par Paypal** (contacter roland.houart@skynet.be auparavant) **ou** par mandat poste international, **EN EURO UNIQUEMENT**, au nom de M. Marc Alexandre, rue de la Libération, 45, B-6182 Souvret
(tous frais y afférents à payer lors de l'acquittement)

FOREIGN SUBSCRIBERS

(NOVAPEX and irregularly published supplements)
Single subscription .... **55 €**

Payable at Banque de la Poste Belge, Brussels, account nr 000-0974225-54, [IBAN: BE42000097422554, BIC: (= SWIFT) BPOTBEB1] of M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret, Belgium, **or** by International Money Order at same address **or 58 euros** with **Paypal** (contact roland.houart@skynet.be before). Payable **IN EURO ONLY**. (All bankcharges to be paid by customer)

Suivant un accord avec la **SIM** (Societa Italiana di Malacologia), nos membres **européens** qui souscrivent également à cette société pour 2010, peuvent payer leur(s) cotisation(s) **à la SBM** pour les deux sociétés. Les membres européens de la **SIM** peuvent faire de même chez eux.
*By common agreement with **SIM**, our **European** members that subscribe to that society for 2010 can pay **to the SBM** the membership fees for both societies. The European members of the **SIM** can do the same paying to their society.*

Dans ce cas, vous obtiendrez une réduction de 2 € pour la SIM et de 2 € pour la SBM, soit :
In this way you can have a discount of 2 € for the SIM and of 2 € for the SBM :

SIM (Bol. Malacologico + Notiziario SIM) .... € 38,00	SBM (Novapex + Novapex/Société) .... € 53,00 (Belgian members: € 38,00)

Editeur responsable: C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye

PRESIDENT HONORAIRE (*Honorary President*)	• M. R. DUCHAMPS, av. Mozart, 52, 1190 Bruxelles
VICE-PRESIDENT HONORAIRE (*Honorary Vice-President*)	• M. E. WAIENGNIER, rue Camille Wollès, 42, 1030 Bruxelles

CONSEIL D'ADMINISTRATION

PRESIDENT	• M. C. VILVENS, rue de Hermalle, 113, 4680 Oupeye 04/248.32.25
VICE- PRESIDENT & BIBLIOTHECAIRE (*Vice-president and Librarian*)	• M. E. MEULEMAN, Sart 32, 4171 Poulseur 04/380 55 16
TRESORIER (*Treasurer*)	• M. M. ALEXANDRE, rue de la Libération, 45, 6182 Souvret 071/46.12.88
SECRETAIRE (*Secretary*)	• Mme A. LANGLEIT, av. Cicéron, 27, bte 92, 1140 Bruxelles 02/726.17.61
ADMINISTRATEUR (*NOVAPEX Manager*)	• M. R. HOUART, St. Jobsstraat, 8, 3400 Landen (Ezemaal) 016/78.86.16

Internet : http://users.swing.be/sw216502/
e-mail : vilvens.claude@skynet.be **ou** e.meuleman@skynet.be

Les articles et textes présentés dans cette revue réflètent l'opinion personnelle de leur(s) auteur(s) et non pas nécessairement celle de la Société ou de l'éditeur responsable.
Tous droits de reproduction, de traduction et d'adaptation des articles publiés dans ce bulletin, réservés pour tous pays.
All rights of reproduction are reserved with the written permission of the board.

PUBLICATIONS PRECEDENTES/ FORMER PUBLICATIONS:
- Bulletin Mensuel d'Information (1966-1971)
- INFORMATIONS de la Société Belge de Malacologie (1972-1985)
- ARION (1986-1999)
- APEX (1986-1999)

SOCIETE BELGE DE MALACOLOGIE

MCZ
LIBRARY
JUL 08 2010
HARVARD
UNIVERSITY

Descriptions of eighteen new species in the genus *Granulina* Jousseaume, 1888 (Gastropoda: Cystiscidae) from the Caribbean Sea

Tony McCleery
"Mantaray", Bascombe Road, Churston Ferrers, Brixham, Devon TQ5 0JJ, England
tonymcc_75@hotmail.com

KEYWORDS. Cystiscidae, *Granulina,* Caribbean Sea, new species, surface texture, resorption

ABSTRACT. A list of all described Caribbean species in the genus *Granulina* is given. Eighteen new species of *Granulina* from the southern Caribbean Sea are described for the first time, four from eastern Panama: *G. colonensis, G. darienensis, G. ocella, G. waltergomezi*; five from Colombia: *G. cartagenaensis, G. gayracaensis, G. granatensis, G. pinguisa, G. velaensis*; six from Venezuela: *G. calla, G. iridisa, G. monjesensis, G. nivalis, G. ovata, G. volcana*; one from Aruba: *G. plagula*; one from Curaçao: *G. producera* and one from Trinidad and Tobago: *G. tobagoensis.* Biodiversity and features of the genus are discussed and previously undescribed features are presented.

INTRODUCTION

The genus *Granulina* Jousseaume, 1888, has a worldwide distribution in tropical and subtropical seas. Most commonly found in littoral and sub littoral depths, it has also been recorded from abyssal depths down to 1,285 m, with a single record at 1,700 m (Coovert and Coovert, 1995: 74).

Caribbean Sea is used herein to include south eastern U.S.A. south of Georgia and Bahamas in the north, Trinidad and Tobago in the south east.

In some Cystiscidae genera Caribbean species do not compare well with the type species – the genera *Persicula* and *Gibberula* are examples. The genus *Granulina* appears to be reasonably homogeneous and all described *Granulina* species known to the author compare well with the type species *Granulina isseli* (G. & H. Nevill, 1875), from the Red Sea coast of Egypt. Size range for the genus is given as 0.8-3.2 mm (Coovert and Coovert, 1995: 73). Caribbean *Granulina* collected by the author range from 1.2 - 3.42 mm.

A total of approximately 75 species of *Granulina* have been described, the majority from north west Africa and the Mediterranean (approximately 35 species). This is followed by the Pacific and Indian Oceans (approximately 20 species), and the Caribbean Sea with only twelve species described to date. These figures fail to indicate the true diversity of this genus; more probably they reflect the historical, low level of interest in micro-molluscs, including families Cystiscidae and Marginellidae. This article will deal with eighteen new species of *Granulina* from the southern Caribbean Sea, where there appears to be a very large number of, as yet, undescribed species.

Preceding the year 2000 only seven recognised Caribbean *Granulina* species had been described:

G. agger (Watson, 1886), W Indies, off Culebra, 714 m.

Granulina amianta (Dall, 1889), USA, North Carolina, 26-95 m.

Granulina antillensis (de Jong and Coomans, 1988), Aruba and Curaçao, 50 m.

Granulina hadria (Dall, 1889), U.S.A., Florida, Cedar Hill, shallow.

Granulina lachrimula (Gould, 1862), USA, Georgia and Florida, 260-732 m.

Granulina ovuliformis (d'Orbigny, 1842), Gulf of Mexico and Caribbean, moderately deep water.

Granulina tinolia (Dall, 1927), USA, north east Florida and Georgia. 538 m.

Since then five more species have been described, all by Espinosa and Ortea, (2000, 2003, 2005), bringing the present total to twelve:

Granulina aidae Espinosa & Ortea, 2005, Cuba, Pinar del Rio, 25-30 m.

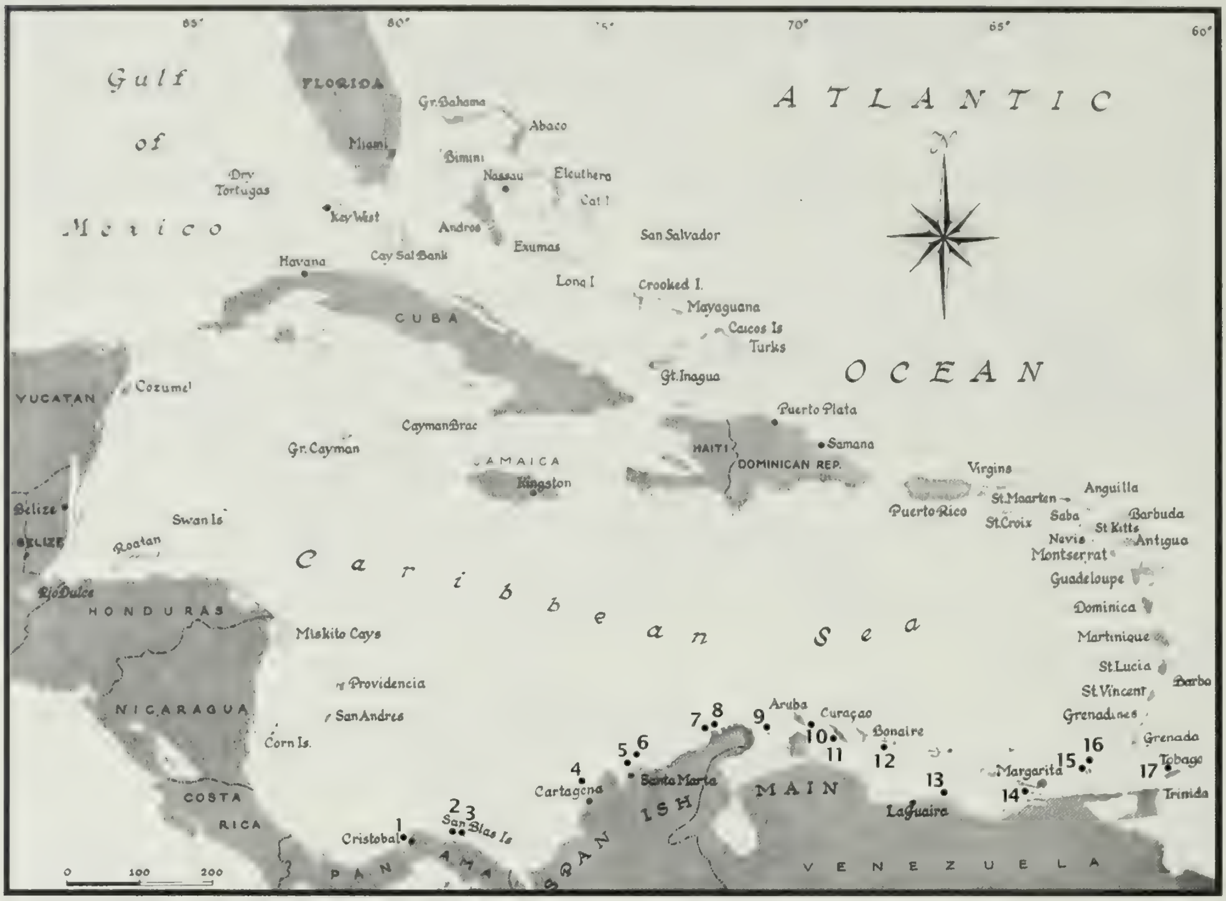
Granulina guanajatabey Espinosa & Ortea, 2003, Cuba, Pinar del Rio, 1-2 m.

Granulina lazaroi Espinosa & Ortea, 2005, Cuba, Pinar del Rio, 25-30 m.

Granulina minae Espinosa & Ortea, 2000, Costa Rica, Manzanilla, 12-15 m.

Granulina molinai Espinosa & Ortea, 2005, Cuba, Pinar del Rio, 25-30 m.

The eighteen new species described herein were collected by the author during the past six years. Five were collected in shallow water down to 10 m on and around dead coral rocks and rubble, eleven by dredging in depths between 18 m and 130 m on sand and mud substrates. The genus was found to be well represented in all areas sampled at these depths. Undescribed *Granulina* continued to be found regularly indicating that there are probably many more species remaining to be discovered. Of the eighteen, fourteen are known only from the type locality. Geographic ranges of the remaining four are small.


85°
80°
75°
70°
65°
60°
Gulf of Mexico
FLORIDA
Gr. Bahama
Abaco
Miami
Bimini
Nassau
Eleuthera
Cat I
Dry Tortugas
Key West
Andros
Exumas
ATLANTIC
San Salvador
Havana
Cay Sal Bank
Long I
Crooked I.
Mayaguana
Caicos Is
Turks
CUBA
Gt. Inagua
OCEAN
YUCATAN
Cozumel
Cayman Brac
Puerto Plata
Gr. Cayman
HAITI
Samana
DOMINICAN REP.
JAMAICA
Kingston
Virgins
Anguilla
St. Maarten
Puerto Rico
St. Croix
Saba
Barbuda
St Kitts
Nevis
Antigua
Montserrat
Belize
BELIZE
Swan Is
Roatan
Rio Dulce
Guadeloupe
Dominica
HONDURAS
Caribbean Sea
Miskito Cays
Martinique
St Lucia
Barbados
Providencia
St Vincent
Grenadines
NICARAGUA
San Andres
Aruba
Curaçao
Bonaire
Grenada
Corn Is.
7, 8
9
10
11
12
16
5, 6
4
Margarita
15
17
Tobago
COSTA RICA
Cartagena
Santa Marta
MAIN
13
14
Trinidad
2 3
San Blas Is
1
Cristobal
SPANISH
La Guaira
PANAMA
VENEZUELA
0 100 200

Map. 1. Caribbean Sea, type localities of the new species

Key to map location numbers

1. Panama, off Colon, to east, 9°31.5'N, 79°52.0'W, 57 m.
2. Panama, off Isla Chichime, San Blas, 9°37.3'N, 78°53.2'W, 75 m.
3. Panama, East Holandes Cays, San Blas, 9°35'N, 078°40'W, 3 m.
4. Colombia, off Cartagena, 10°22.4'N, 75°35.8'W, 25-41 m.
5. Colombia, Gayraca Bay, Santa Martha, 11°19.5'N, 74°06.3'W, 7 m.
6. Colombia, off Santa Martha, 11°18.0'N, 74°12.2'W, 90-101 m.
7. Colombia, off Cabo de Vela, 11°57'N, 72°36'W, 58 m.
8. Colombia, off Cabo de Vela, 12°06.7'N, 72°19.3'W, 50-59 m.
9. Venezuela, Monjes del Sur, harbour, 12°21.5'N, 70°54.1'W, 3-10 m.
10. Aruba, Boca Grandi, 12°27.3'N, 59°52.6'W, 1-2 m.
11. Curaçao, off Piscadera Bay, 12°07.5'N, 68°58.5'W, 130 m.
12. Venezuela, Las Aves de Sotavento, 12°01.66'N, 067°38.05'W, 1 m.
13. Venezuela, Cabo Codera, 10°35.2'N, 66°03.9'W, 18 m.
14. Venezuela, off Isla Cubagua, to north, 10°52.4'N, 64°12.4'W, 22 m.
15. Venezuela, Isla Grande, Islas Los Testigos, 11°22.8'N, 63°08.1'W, 28 m.
16. Venezuela, off Islas Los Testigos, to north, 11°28'N, 63°06'W, 73 m.
17. Trinidad and Tobago, off Tobago, to north, 11°16'N, 60°49'W, 86 m.

Terminology. The author has, in general, followed terminology established by Coovert and Coovert (1995). The terms "siphonal notch" and "posterior notch" have precise meanings and are clearly described (Coovert and Coovert, 1995: 50). "Siphonal canal" (Coovert and Coovert, 1995: 47), and posterior canal are used by the author, but do not indicate the presence or absence of a notch which is a separate and distinct feature.

Shell morphology. Shell shape of Caribbean *Granulina* ranges between globose, pyriform and perfectly oval. All are colourless but vary slightly in opacity; are generally, heavily callused; have strongly denticulate, curved, strongly curled in lip; four, generally strong, columellar plications, almost always excavated and intricately formed distally in a wide variety of distinct shapes. All have immersed spire, medium to very strong external varix extending around posterior and siphonal canals, and most have a parietal callus ridge extending posteriorly from the columellar plications to meet a lumpy posterior ridge. All have Type 2 animal (Coovert and Coovert, 1995: 73), and Type 4 radulae (Coovert and Coovert, 1995: 56).

Surfaces are minutely textured in a wide variety of forms, generally finest on light callus wash extending over the body whorl, and strongest on the callus around the siphonal and posterior canals (Figs 109-132). Callus on body whorls is not well attached and very easily removed by light abrasion, confirming that it is indeed a wash and not micro-sculpture (Figs 139-141). When callus wash is removed faint growth lines are often exposed (Fig. 141). In dead collected shells callus wash on the body whorl was generally found to be absent due to abrasion.

It is well known that some *Granulina* spp. have textured surfaces: *Granulina fernandesi* Boyer & Rolán 1999, and *G. aidae* Espinosa & Ortea, 2005, are examples of shells with unusually strong texture for the genus. Boyer and Rolán (1999: 1-10) state "This feature is however unique and constant in each species, and well representative of the whole genus, even the type species *G. isseli* which represents itself a faint "leopard patterned" microsculpture on a smooth ground". Species which appear to be smooth and shiny to the human eye were previously believed to be without texture, but recent S.E.M. work by the author confirms that probably all *Granulina* exhibit some degree of texture. It was observed that the form of texture is variable over the surface. For example, in *Granulina colonensis* n. sp., surface of the posterior canal is evenly covered by scales, but callus on the body whorl, adjacent to the lumpy ridge bordering the posterior canal is, at first, comprised of distinct round, evenly sized granules, changing abruptly into less regularly shaped and very variably sized granules (Figs 110-112). The body whorl of *Granulina nivalis* n. sp. was found to be lightly textured internally (Figs 136-138). It is not known if this feature is widespread as only this species has been examined so far. It seems probable that surface texture will be useful in species identification but first, more research is necessary in order to establish the degree of both intra-population and inter-population variation which exists.

Granulina have partially resorbed internal whorls which Coovert and Coovert (1995: 73) termed "modified cystiscid internal whorls". A drawing presented by Coovert and Coovert (1995: 49, fig. 4), and their description: "columella with 2 internally reduced columellar plications, plus one or two pseudo-continuous plications" (Coovert and Coovert,1995: 73) is somewhat confusing and is at variance with the author's findings. An explanation for this may be that Coovert and Coovert illustrated internal plications of *G. hadria* (Dall, 1889), on which species they carried out a very thorough study. Therefore, it seems probable that *G. hadria* differs from many other Caribbean *Granulina* in this respect. Doubt about the accuracy of Coovert and Coovert's conclusions was expressed by Boyer and Rolán (2004: 162), who suggested that Coovert and Coovert had incorrectly interpreted their drawing. They stated that *Granulina* have fully developed coiling of the internal columellar plications, but this is clearly contrary to Coovert and Coovert's findings. Recent work by the author on a number of Caribbean *Granulina* sp. revealed that three plications remain, possibly somewhat reduced, for approximately one turn internally, and can frequently be detected through the body whorl in fresh dead shells (Fig. 55). A number of shells of *Granulina tobagoensis* n. sp. were opened to expose internal whorls and columellar plications (Figs 133-135). It was found that a high degree of resorption had occurred, that resorption was complete posteriorly, and that the plications were much reduced. It can be seen in these examples that resorption is complete posteriorly (Figs 133) and in an early stage anteriorly where the columella remains strong. One juvenile was examined (Fig 135) and resorption was noted to be at an advanced stage posteriorly. Therefore, it is concluded that resorption commences early in the life of the animal of *G. tobagoensis*. The sample was small and much work remains to be carried out, but these preliminary findings support those of Coovert and Coovert.

The shell morphology within the genus *Granulina* is very variable and it is no surprise to find variations in the precise way internal resorption takes place. The important point in this matter is that significant resorption and reduction of columellar plications do take place in *Granulina* species. Partial resorption of internal whorls with reduced columellar plications is the key feature to be considered in family assignment of all marginelliform genera (Coovert and Coovert, 1995: 43).

Animal chromatism. In *Granulina* external animal morphology and chromatism exhibit more features than are seen in other Cystiscidae. Some of these features have not previously been documented. For example, the extreme distal elongation of the metapodium (Figs 12-13), and the posterior papillae in some species (Figs 5, 12, 35). On occasions, when photographing live animals an apparently rounded metapodium was observed to gradually extend and become long, thin and very finely elongate distally (Figs 12-13). Occasionally the distal portion is transparent and unmarked and can be very difficult to observe (Fig. 14). Mantles are often only partially visible, seldom being seen fully extended, and are very variable: surfaces can be smooth, pustulose, and occasionally bear long, plume-like posterior papillae which are located on a thick, cap-like area, posterior medially (Figs 16-17). These papillae were observed to extend and retract rapidly: approximately one second to fully extend to a length which equated with shell length, and a similar time to fully retract. It seems likely that elements which inflate papillae are located in the cap-like area. The number of papillae varies from one to five (Figs 12, 21, 35). Pustules also extend and retract, but were never observed to do so as rapidly as the papillae (See "Remarks" under description of *Granulina cartagenaensis* n. sp.). When magnified, the mantle chromatism was observed to be comprised of extremely small spots amongst more prominent features (Figs 30-32). A common feature of shallow water, rock dwelling species is large ocellated spots, most noticeable when the mantle is extended (Fig. 31). Ocellated spots were not observed on species dredged in deep water from mud or sand substrates. Marks on the metapodium and tentacles, when magnified to around X50, were observed, in live animals, to be three dimensional and to be comprised of many minute irregularly shaped marks, apparently floating within the semi-transparent membrane at different levels and not on the surface. As a metapodium is extended it becomes thinner and the marks which at first may appear to be of solid colour, become stretched and often quite diffuse (Figs 33-34). Iridescent marks are found on the foot of some *Granulina* (Fig. 20). These were first observed in live animals collected by dredging off the mountainous, north western coast of Venezuela where the substrate included a noticeable proportion of gravel containing quartz and pyrites which sparkled when magnified in strong light. It seems possible that the presence of these iridescent markings is an adaptive feature. However, similar iridescent marks were subsequently found in another *Granulina* species (Figs 28-29) in the extensive area of muddy substrates to south and west of Isla Margarita, Venezuela, where there was no evidence of any gravel particles. This contradicts the hypothesis and leaves the matter open to further study.

Melanism was noted to be very common in some *Granulina* species. For example, in *Granulina monjesensis* from the harbour, Monjes del Sur, Venezuela (Fig. 25), and *G. ocella* from East Holandes Cays, San Blas, Panama (Fig. 32), where approximately half the samples collected were melanistic. Many other species collected in the southern Caribbean showed no sign of melanism. In this respect, the genus *Granulina* and the genus *Gibberula* are very similar.

Identification of species. This has been based on shell morphology, and animal morphology and chromatism when live animals were available. Several radulae were extracted, and were noted to be Type 4 (Coovert and Coovert, 1995: 56), typical of the genus *Granulina*, but the number examined was considered too small to be useful for species assessment. Some features of shell morphology are dependent on the age of the animal, being weak or absent in young adults and often becoming very strong in shells of old animals. For example, in *Granulina*, the callus around the posterior canal, and to a lesser extent around the siphonal canal, appears to continue to grow throughout the life of the animal, whereas growth of labial denticles and columellar plications appears to slow down or stabilise. It was observed that old shells have a lower W:L ratio than young adult shells. The reason is that callus growth at both ends of maturing shells increases shell length more than width.

It appears that the intricate and complicated emergent parts of columellar plications are associated with the parietal callus ridge (Figs 92-102) because, lumps and kinks which occur, particularly on the second and third plication, are located on the projected line of the parietal ridge, and also because excavation of columellar plications is aligned with the inner edge of the ridge. They are very constant within each species and are useful at specific level.

The morphology of the foot is problematical and of little use for specific assessment because of difficulty in determining when a metapodium is fully extended. It was noticed that there was a tendency for the individuals in live sample groups to behave similarly when being photographed. For example, if one specimen in a group was observed to have a rounded metapodium, then all specimens in that group tended to show the same state, but on other occasions some individuals of the same species might behave differently. Sometimes mantles were not visible and on other occasions they were fully extended. It is believed that these incosistencies may reflect the degree of traumatism suffered by the animals during collecting and sorting, the time delay before photographing took place or the water conditions in the aquarium. There were incidents when one or more individuals in such a group would extend its metapodium to become very elongated and thin distally. This made it impossible to accurately assess foot length unless it was extended to be very long and narrow distally – definitely the fully extended state. From these observations it follows that all Caribbean *Granulina* may be able to extend the metapodium to a very elongate state, but more work on live animals is necessary in order to resolve this matter.

With the large number of features to consider *Granulina* species are often relatively easy to identify by shell morphology alone. They are certainly more easily identified than shells of *Gibberula* species in which there are fewer variables and in which it is often essential to examine both shell and animal in order to achieve accurate specific assessment (McCleery, 2008, 2009). However, for example, in this article *G. monjesensis, G. ocella, and G. plagula* would not have been described as separate new species without observation of animal chromatism. Morphological variations alone between shells of these three new species would not have been considered sufficiently different for positive separation. Now that it has been clearly demonstrated that they are distinct species, largely due to differences in animal chromatism, the true importance of very small differences in their shell morphology can be recognized.

Discussion. Differences in shell morphology between *Granulina* species collected in shallow rocky or reef areas and those dredged in muddy substrates are significant. Shells from the former habitat tend to be small, and have more rounded ends (Figs 61-69), whereas, those dredged from deeper, muddy habitats are frequently larger, very heavily callused, and slightly produced at both ends (Figs 40-45).

Shells of *Granulina* spp. are normally semi-transparent when fresh, but tend to gradually become translucent white when dried. Dead collected shells are frequently opaque, and occasionally extremely hyaline, particularly when collected in fine mud – probably long-dead shells.

As was found to be the case in the genus *Gibberula* Swainson, 1840 (McCleery, 2008, 2009), *Granulina* species also appear to form species groups with wide geographical ranges. For example, *G. producera* n. sp. from Curaçao appears to be closely related to *G. molinai* Espinosa and Ortea, 2005, from Cuba, and the author has in his collection several other undescribed species belonging to this group, represented by only one shell, from widely separated locations. It is expected that many species within such species groups will be found to have small geographic ranges and to be endemic to their type localities. No attempt has been made herein to appraise the various groupings within the genus *Granulina.*

MATERIAL and METHODS

Hand dredging in sand or muddy substrates and the use of a hand operated suction pump on rocks and rubble substrates were the most productive methods of collecting *Granulina* in shallow waters down to approximately 30 metres. Night diving yielded some positive results as specimens could be picked up from sand and rubble, or off rocks. Many species were collected by dredging from the author's yacht with the aid of a small hydraulically operated reel. The resultant grit from all methods of collection was screened into four grades. The finer screenings were placed in bowls of sea water and covered. Live animals then crawled up the sides where they could be picked up. The finer grades of grit from deep dredging were also sorted visually for dead shells, which comprised an average of approximately 95 percent of all shells collected by dredging. As dredging techniques improved so did the percentage of species containing live animals. Before collecting ceased, approximately half of all species collected by dredging contained live material, probably due to the dredges skimming the surface of substrates rather than by biting too deeply and becoming blocked – much dead material appears to lie in the solid, settled mud, but live animals inhabit the surface layer and loose algal material on top of the solid mud.

Samples from live material were photographed in a small aquarium below a microscope with a digital camera mounted on top. The same equipment was used for detailed imaging of dried shells and was calibrated so that shell dimensions could be obtained from data displayed by the software. Dimensions of shells are accurate to plus or minus 2 %, and those of live animals to plus or minus 4%. All relevant data, including a chosen shell image were entered in a database. One special feature of the database is a comparator which enables a simple and very effective means for comparing two or more shell images. This proved to be very useful in highlighting small morphological differences.

Shell images are presented at X25 magnification, giving a true impression of relative sizes. Animal images are presented at various magnifications in the range 10X to 20X and images of plications (Figs 91-108) at a uniform image size of 5 cm which equates with approximately X50 to X140 depending on shell length. A number of S.E.M. images of surface texture are presented at various magnifications and have integral scale bar.

Abbreviations

MNHN: Muséum national d'Histoire naturelle, Paris.
AWC: Andrew Wakefield Collection.
TMC: Tony McCleery Collection.
ad.: adult specimen.
juv.: juvenile specimen.
lv.: live collected.
dd.: dead collected.
L.: shell length.
W.: shell width.

SYSTEMATICS

Family **CYSTISCIDAE** Stimpson, 1865.
Subfamily **GRANULININAE** Coovert and Coovert, 1995.
Genus ***Granulina*** Jousseaume, 1888.
Type species: *Marginella pygmaea* Issel, 1869 (non *Marginella pygmaea* G. B. Sowerby II, 1846), = *Marginella isseli* G. & H. Nevill, 1875 (nom. nov.).

Granulina volcana n. sp.

Figs 1-2, 5-6, 37-39, 91

Type material. Off Islas Los Testigos, to north, Venezuela, 11°28'N, 63°06'W, 73 m.
Holotype. 2.67 x 1.87 mm, W:L 70%, MNHN 21985; paratype 1. 2.67 x 1.88 mm, W:L 70%, MNHN 21986; paratype 2. 2.70 x 1.88 mm, W:L 70%, AWC; paratype 3. 2.73 x 1.94 mm, W:L 71%, AWC; paratype 4. 2.83 x 1.98 mm, W:L 70%, TMC; paratype 5. 2.44 x 1.61 mm, W:L 66%, TMC.

Other material. 2 ad. lv., 2 juv. lv., a number of broken pieces, off Islas Los Testigos, to north, Venezuela, 11°28'N, 63°06'W, 73 m, TMC.

Type locality. Off Islas Los Testigos, to north, Venezuela, 11°28'N, 63°06'W (Map ref. 16).

Description. Shell without colour, obovate, tending to pyriform. Size range 2.44 x 1.61 mm to 2.83 x 1.98 mm, W:L 66-71%. Body whorl translucent white, weak striations close to external varix, covered by almost smooth, very light callus wash. Lip strongly and evenly curved, curled inwards, evenly wide, moderately strong. Fourteen denticles almost fill inner edge, widely spaced posteriorly. In side view, lip evenly convex. External varix wide, widest and raised on dorsum medially, narrowest anteriorly, sweeps around posterior canal spreading slightly over dorsum, highest above insertion point, forms lumpy ridge ventrally, merges with parietal callus ridge. Weakening varix sweeps around anterior canal, merges with anterior callus, labial edge merges with raised first columellar plication. Four plications fill approximately one third of aperture. First moderately deep, narrow. Second strongest, strongly kinked, merges with anterior callus. Third strong, short, rounded lump distally. Fourth weakest, smaller rounded lump distally. Weak parietal ridge commences at distal end of fourth plication, extends posteriorly and merges with posterior, lumpy ridge. All plications excavated, particularly second and third. Aperture moderately and uniformly wide. Surface of all callus deposits textured with minute pustules.

Animal: Length of fully extended foot unknown, width approximately same as shell, semi-transparent with several small off-white marks laterally, increasing in size posteriorly. Largest mark substantial, white, level with posterior end of shell. Small off-white marks on metapodium concentrated medially form distinct medial line, adjacent bright red lines formed by contiguous red spots anteriorly, reducing in density and fading out distally, further small, scattered, off-white spots extend to lateral edges. Propodium off-white, formed by many small marks which fade out distally. Semi-transparent tentacles, long, thin with three irregularly spaced marks. Black eyes located on basal swellings. Siphon moderately long, thin, semi-transparent with many small off-white spots, distinctive orange-red edges basally. Mantle not observed fully extended. Small swellings visible laterally, therefore, believed to be pustulose. Small areas of colours can also be detected: off-white, yellowish brown, reddish brown, turquoise, and black. Five simple papillae grouped posterior medially on mantle. Mantle roof chromatism appears diffuse through translucent white dorsum, substantially off-white with some darker areas. Approximately twelve short, yellowish, elongate marks on darker patch can be detected emerging from under anterior dorsal callus, fanning out posteriorly. Almost horizontal, narrow, transverse whitish band located posteriorly.

Distribution. Only known from the type locality.

Remarks. *Granulina volcana* n. sp. is closest to *G. calla* n. sp. with which it is compared. These two closely related species were collected from localities about seven miles apart. The type locality of *Granulina volcana*, 73 m, is subject to the very strong, westward flowing Equatorial current which enters the Caribbean between Trinidad and Tobago, and Grenada, whereas, the type locality of *G. calla,* 28 m, is close to Isla Grandi, Los Testigos islands, and considerably sheltered from strong currents. *Granulina volcana* is consistently lightly callused, the varix weakens and sweeps around posterior canal, the posterior ridge is smooth, whereas *G. calla* is consistently very heavily callused, has very strong callus at the apex, the varix retains a strong profile fully around the posterior canal, and the posterior ridge is relatively long and lumpy. Chromatism also distinguishes between these two species: *G. volcana* has two strong red lines on the metapodium, a siphon with distinct orange-red edges and no white marks (Figs 2, 5), whereas, *G. calla* has random red spots on the metapodium, the siphon with three white spots basely, no orange-red colouring (Figs 4, 7). The differences described in the shell morphology between these two species were consistent in all mature adult shells examined.

Etymology. The name was inspired by the impression of an erupting volcano given by the chromatism of metapodium and its posterior papillae. Latin for volcano is *volcanus*.

Granulina calla n. sp.

Figs 3-4, 7, 40-42, 92

Type material. Isla Grande, Islas Los Testigos, Venezuela, 11°22.8’N, 63°08.1’W, 28 m.
Holotype. 2.57 x 1.75 mm, ad. lv., W:L 68%, MNHN 21954; paratype 1. 2.69 x 1.90 mm, W:L 70%, MNHN 21955; paratype 2. 2.64 x 1.82 mm, W:L 69%, AWC; paratype 3. 2.62 x 1.80 mm, W:L 69%, AWC; paratype 4. 2.65 x 1.84 mm, W:L 70%, TMC; paratype 5. 2.53 x 1.74 mm, W:L 69%, TMC.

Other material. 2 ad. lv., 1 juv. lv., 4 ad. dd., Isla Grande, Islas Los Testigos, Venezuela, 11°22.8’N, 63°08.1’W, TMC.

Type locality. Isla Grande, Islas Los Testigos, Venezuela, 11°22.8’N, 63°08.1’W (Map ref. 15).

Description. Shell without colour, obovate, posterior slightly produced. Size range 2.53 x 1.74 mm to 2.69 x 1.90 mm, W:L 68-70%. Body whorl semi-transparent, some very weak irregularly spaced striations, covered by very light callus wash, finely textured with minute pustules. Lip evenly curved, curled inwards strongly, wide, widest medially. Fourteen somewhat irregular denticles fill inner edge, closely spaced anteriorly, wider medially, more so posteriorly. In side view, lip slightly convex. Very strong external varix, slightly raised on dorsum medially, sweeps very strongly around posterior canal, stops abruptly ventrally, forms very strong, lumpy, callus ridge, merges with weak parietal callus ridge. Varix, remaining wide, sweeps around siphonal canal, merges with small area of anterior callus and raised first columellar plication. Four strong plications fill approximately one third of aperture. First moderately deep, narrow. Second strongest, strongly kinked as it emerges, merges with moderately heavy anterior callus. Third strong, short, pointed lump distally. Fourth weakest, smaller pointed lump distally. Weak, even, parietal ridge extends posteriorly from second plication, merges with posterior ridge. All plications excavated, second and third strongly, fourth almost completely. Surface of all callus deposits, including lip and space between plications, textured with minute pustules approximately three times larger than those covering dorsum. Aperture, evenly and moderately wide.

Animal: Length of fully extended foot unknown, width approximately same as shell, semi-transparent with several off-white marks laterally. Random smaller white marks on metapodium form indistinct medial line extending distally. Adjacent to line, on each side, approximately fifteen small, deep red spots intermingled with off-white ones. Further small, off-white spots extend from red spots to lateral edges. Propodium largely off-white with some minute red, brown and white marks. Semi-transparent tentacles, long, thin with five or six irregularly spaced, off-white marks. Black eyes located on basal swellings. Siphon moderately long, thin for genus. Three or four diffuse white spots at base, fine off-white spots intermingled with fewer reddish brown spots, becoming numerous distally. Mantle not observed extended. Small swellings visible laterally, therefore, believed to be pustulose. Small areas of colours also detected – off-white, yellowish brown, reddish brown, turquoise, and black. Five simple papillae grouped posterior medially on mantle (Fig. 7). These were observed to extend and retract rapidly, independently of mantle and each other. Mantle roof chromatism visible through translucent dorsum, substantially off-white with numerous darker areas bearing small yellowish marks and occasional dull reddish spots. Approximately eight short, yellow, elongate marks on darker patch emerge from under anterior dorsal callus and fan out posteriorly. Towards posterior, narrow transverse whitish band slopes downwards to right at about 10° off horizontal. A few minute irregular black marks which appear to be attached internally to mantle roof can be detected.

Distribution. Only known from the type locality.

Remarks. *Granulina calla* n. sp. is closest to *G. volcana* n. sp. with which it is compared. These two closely related species were collected from localities about seven miles apart. The type locality of *G. volcana*, 73 m, is subject to the very strong, westward flowing Equatorial current which enters the Caribbean between Trinidad and Tobago, and Grenada, whereas, the type locality of *G. calla,* 28 m, is close to Isla Grandi, Los Testigos islands, and is considerably sheltered from strong currents. *G. volcana* is consistently lightly callused and has a smooth posterior callus ridge, whereas *G. calla* is consistently very heavily callused with very strong callus at apex, the external varix retains a strong profile fully around the posterior canal, and has a relatively long and lumpy posterior ridge. Chromatism also distinguishes between these two species: *G. volcana* has two strong red medial lines on the metapodium, a siphon with distinct orange-red edges and no white marks (Figs 2, 5), whereas, *G. calla* has random red spots on the metapodium, the siphon with three white spots basely and no orange-red colouring (Figs 4, 7). Differences described in shell morphology between these two species was consistent in all mature adult shells examined.

Etymology. The name refers to the heavy callus and strong knobbly deposits. The Latin for callus is *callum.*

Granulina colonensis n. sp.

Figs 8-9, 43-45, 93, 109-112

Type material. Off Colon, to east, Panama, 9°31.5'N, 79°52.0'W, 57 m.
Holotype. 1.98 x 1.31 mm, W:L 66%, MNHN 21958; paratype 1. 1.96 x 1.35 mm, W:L 69%, MNHN 21959; paratype 2. 1.95 x 1.27 mm, W:L 65%, AWC; paratype 3. 2.00 x 1.35 mm, W:L 67%, AWC; paratype 4. 1.76 x 1.20 mm, W:L 68%, TMC; paratype 5. 1.96 x 1.33 mm, W:L 68%, TMC.

Type locality. Off Colon, to east, Panama, 9°31.5'N, 79°52.0'W, 57 m (Map ref. 1).

Description. Shell without colour, obovate, slightly biconic. Size range 1.76 x 1.20 mm to 2.00 x 1.35 mm, W:L 65-69%. Body whorl semi-transparent, light callus wash, slightly textured. Lip evenly curved, curled inwards slightly, moderately narrow, widest medially, completely filled by twenty two denticles. In side view, lip convex. External varix very strong, wide, slightly wider posterior medially, not raised on dorsum, retains profile and sweeps around posterior canal with little apparent shoulder, stops abruptly at aperture, very strong, wide, lumpy, callus ridge continues anteriorly, merges with parietal callus ridge. Varix, remaining wide, sweeps around anterior canal, weakening, merges into anterior callus, labial edge merges with slightly raised first columellar plication. Four plications fill approximately 30% of aperture. First sinuous, slightly raised. Second, third and fourth plication discontinuous due to very deep parietal excavation. Distal portion of second stepped downwards at distinct medial lump, extends onto anterior callus with wide axial dimension, widely rounded distally. Distal portions of third and fourth combine in substantial vertical ridge with fine distal end turned outwards onto anterior callus. Posterior end weakens and merges with weak parietal ridge. Inner portion of fourth plication, located on parietal wall deep inside aperture. Aperture moderately and uniformly wide. Surfaces generally lightly textured: callused surfaces with scales and ridges, adjoining body whorl with random sized, roundish lumps (Figs 110-112).

Animal: Length of fully extended foot more than twice length of shell, width approximately same as shell, semi-transparent. Small off-white marks intermingled with many smaller reddish brown spots laterally. Metapodium finely elongate distally. Solid, wide, off-white, medial line extends posteriorly, approximately one third length of metapodium, widening and becoming less solid medially, weakening and fading distally. Weak marks between medial line and edge of metapodium diffuse, off-white, comprised of many small spots. Marks reduce in size posteriorly, intermingle with smaller off-white and reddish brown spots. Edges of metapodium, except distally, highlighted by small, solid, off-white, dashes, generally separated by reddish brown spots. Off-white spots densely concentrated on propodium, particularly close to head. Semi-transparent tentacles, long, thin, rust coloured over whole length with diffuse off-white marks, strongest distally. Eyes black. Siphon and mantle not observed fully extended. Siphon with concentrated small off-white spots. Mantle: poorly observed. Cap-like posterior, suggestive of papillae bears one strong pustule medially (Fig. 9). Mantle roof chromatism substantially off-white with some pale orange spots. Short, pale, whitish, transverse band located posterior medially, sloping slightly downwards to right.

Distribution. Only known from the type locality.

Remarks. *Granulina colonensis* n. sp. appears to be most closely related to *G. darienensis* n. sp. (Figs 46-48) with which it is compared. The shell of *G. colonensis* is heavier and more biconic in shape, the lip wider, the varix stronger, posterior and siphonal canals are less flared (Fig. 110) than *G. darienensis* (Fig. 118). The first plication not thickened medially as in *G. darienensis* (Fig. 94). Body whorl surface is textured with small round granules of various sizes (Figs 110-112), but covered by an even scaly texture in *G. darienensis* (Figs 118-120). Chromatism has much in common between the two species, but the strong off-white medial line on the metapodium of *G. colonensis* (Figs 8-9), is absent in *G. darienensis* (Figs 10-11). Pale annular rings highlight the eyes of *G. darienensis* but are absent in *G. colonensis*. These two new species are separated geographically by approximately seventy miles.

Etymology. Colon city is located at the Caribbean end of the Panama canal. *Granulina colonensis* was collected a few miles to the east and takes its name from the city of Colon.

Granulina darienensis n. sp.

Figs 10-11, 46-48, 94, 117-120

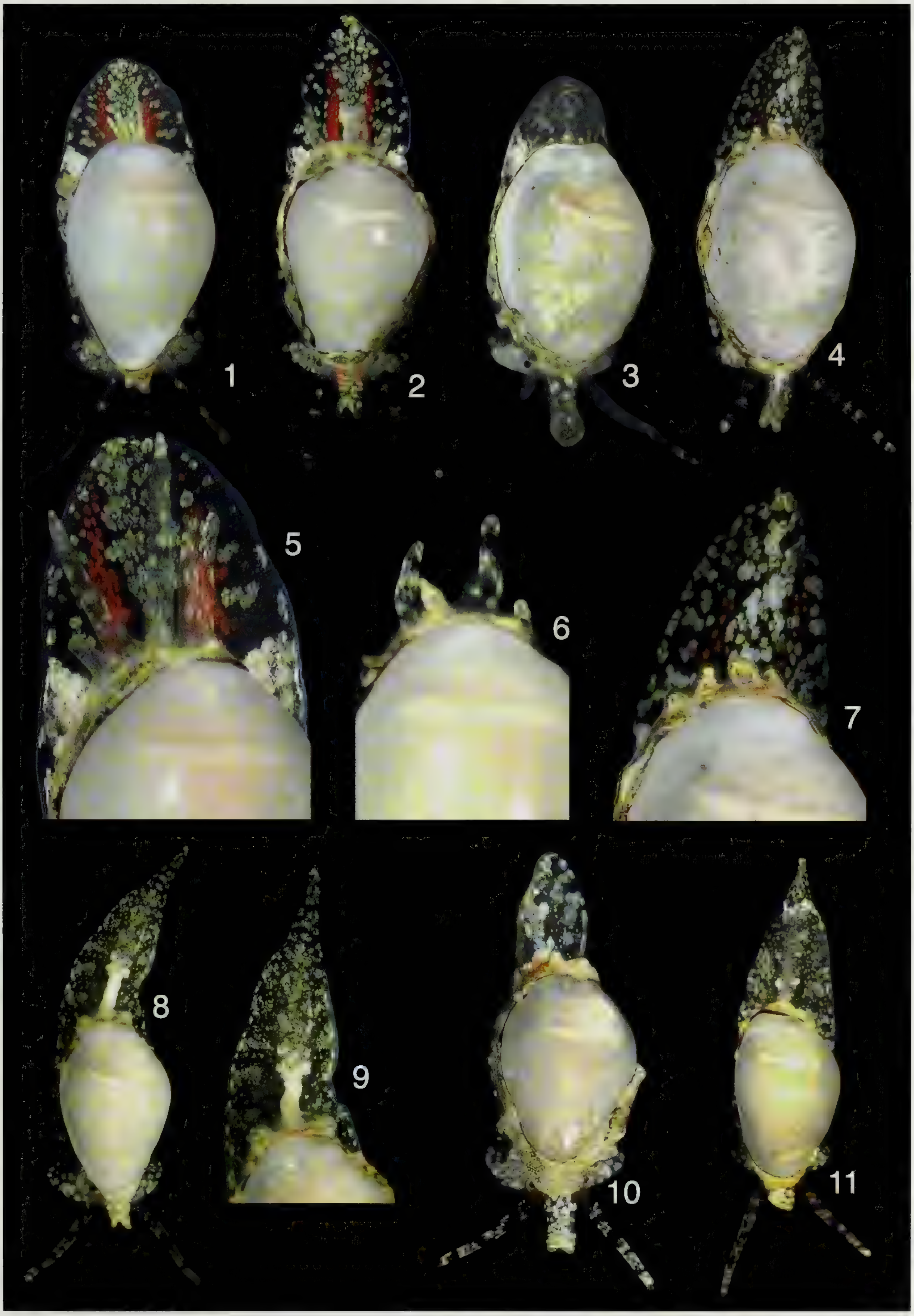
Type material. Off Isla Chichime, San Blas, Panama, 9°37.3'N, 78°53.2'W, 75 m.
Holotype. 2.14 x 1.39 mm, W:L 65%, MNHN 21960; paratype 1. 1.99 x 1.34 mm, W:L 67%, MNHN 21961; paratype 2. 1.88 x 1.30 mm, W:L 69%, AWC; paratype 3. 2.17 x 1.37 mm, W:L 63%, AWC; paratype 4. 2.02 x 1.31 mm, W:L 65%, TMC; paratype 5. 2.06 x 1.36 mm, W:L 66%, TMC.

Other material. 16 ad. dd., off Isla Chichime, San Blas, Panama, 9°37.3'N, 78°52.4'W, 75 m; 7 ad. dd., off Isla Linton, Panama, 9°31.5'N, 79°52.0'W, 64 m, TMC.

Type locality. Off Isla Chichime, San Blas, Panama, 9°37.3'N, 78°52.4'W (Map ref. 2).

Figures 1-11

1-2, 5-6. *Granulina volcana* n. sp. Off Islas Los Testigos, to north, Venezuela, 11°28'N, 63°06'W, 73 m.
1. Holotype. 2.67 x 1.87 mm, W:L 70%, MNHN 21985; **2.** Young adult spm. 2.71 x 1.86 mm, W:L 69%, TMC; **5.** Young adult spm. 2.49 x 1.76 mm, W:L 71%, TMC; **6.** Young adult spm. 2.68 x 1.86 mm, W:L 69%, TMC.
3-4, 7. *Granulina calla* n. sp. Isla Grande, Islas Los Testigos, Venezuela, 11°22.8'N, 63°08.1'W, 28 m.
3. Holotype. 2.57 x 1.75 mm, W:L 68%, MNHN 21954; **4, 7.** Paratype 5. 2.53 x 1.74 mm, W:L 69%, TMC.
8-9. *Granulina Colonensis* n. sp. Holotype. Off Colon, to east, Panama, 9°31.5'N, 79°52.0'W, 57 m. 1.98 x 1.31 mm, W:L 66%, MNHN 21958.
10-11. *Granulina darienensis* n. sp. Off Isla Chichime, San Blas, Panama, 9°37.3'N, 78°53.2'W, 75 m;
10. Holotype. 2.14 x 1.39 mm, W:L 65%, MNHN 21960; **11.** Adult spm. 2.19 x 1.41, W:L 64%, TMC.


1
2
3
4
5
6
7
8
9
10
11

Description. Shell without colour, obovate. Size range 1.88 x 1.30 mm to 2.17 x 1.37 mm, W:L 63-69%. Body whorl translucent white with light callus wash, lightly textured. Lip evenly curved, curls inwards slightly, narrow, twenty three irregular, weak denticles almost fill inner edge, fading out slightly above anterior canal. In side view, lip convex. External varix strong, moderately wide, widest medially, weakens, sweeps round slightly flared posterior canal, fades out over immersed spire. Callus remains wide, develops lumpy external edge ventrally, merges with very weak parietal callus ridge. Posterior callus extends slightly over dorsum. Weakening varix sweeps around slightly flared siphonal canal, merges with anterior callus. Labial edge of weakening varix, merges with slightly raised first columellar plication. Four plications fill approximately 30% of aperture. First strong with significant lump medially. Second, strong with large, pointed lump as it emerges from deep excavation, thins distally, fades out on anterior callus. Third and fourth plications discontinuous due to a very deep parietal excavation. Emergent portion of third, strong and curved, anterior part continues outwards, stops before anterior callus, medial portion continues posteriorly, merges with very weak parietal ridge. Fourth located deep inside aperture. Aperture moderately and uniformly wide. Surfaces lightly textured with random sized scales (Figs 118-120).

Animal: Length of fully extended foot approximately twice length of shell, width approximately same as shell, semi-transparent. Lateral marks not observed. Metapodium pointed distally, variety of shapes and sizes of marks give variegated effect in shades from white to yellowish-white, intermingled with rust brown spots. Concentration of marks shows as faint medial line. Propodium with small off-white spots intermingled with some smaller rust spots. Semi-transparent tentacles, long, thin, with moderately heavy off-white marks, intermingled with some rust marks, distinct rust coloured areas basally, black eyes with off-white annular rings on slight swellings. Siphon moderately long, thick, semi-transparent with many small off-white spots and two small rust spots. Mantle: papillae not observed, but may be present, otherwise weakly pustulose. Chromatism with fine yellowish-white and rust spots, larger marks intermingled with fine black spots. Mantle roof chromatism substantially yellowish-white with pale orange spots and some darker areas. Approximately six indistinct, short, whitish, elongate marks on darker patch emerge from under anterior dorsal callus, fanning out posteriorly. Pale whitish, transverse band located posteriorly, slopes slightly downwards to right.

Distribution. Known from the type locality and off Isla Linton, Panama.

Remarks. *Granulina darienensis* n. sp. is closest to *G colonensis* n. sp. with which it is compared. *G. darienensis* has a somewhat lighter, more rounded shell, narrower lip, weaker varix around siphonal canal, and posterior and siphonal canals considerably more flared than in *G. colonensis*. The first plication bears a medial lump which is absent in *G.* colonensis. The body whorl surface is covered by an even scaly texture (Figs 118-120), whereas, in *G. colonensis* the body whorl is textured with small round granules of various sizes (Figs 110-112). Chromatism has much in common between the two species, but the strong off-white medial line on the metapodium of *G. colonensis* is absent in *G. darienensis.* The eyes of *G. darienensis* are highlighted by pale annular rings, but absent in *G. colonensis*. These two new species are separated geographically by approximately seventy miles.

Etymology. This species is named after the mountains of Darien which form the backdrop to the archipelago of San Blas.

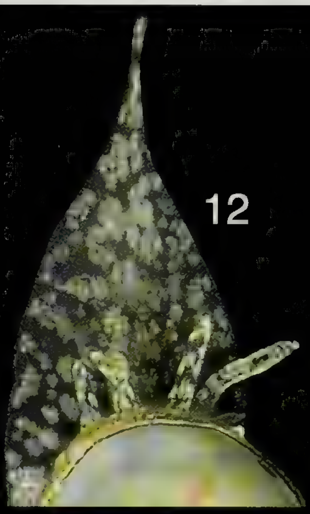
Granulina gayracaensis n. sp.

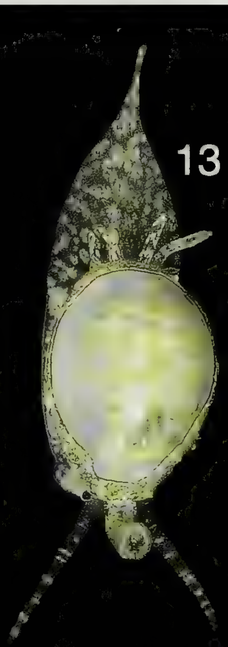
Figs 12-15, 49-51, 95

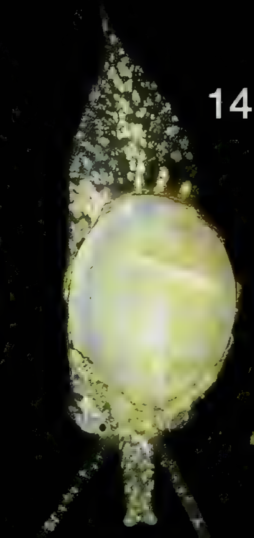
Type material. Gayraca Bay, Santa Martha, Colombia, 11°19.5'N, 74°06.3'W, 7 m.
Holotype. 1.75 x 1.22 mm, W:L 70%, MNHN 21962; paratype 1. 1.61 x 1.08 mm, W:L 67%, MNHN 21963; paratype 2. 1.92 x 1.29 mm, W:L 67 %, AWC; paratype 3. 1.64 x 1.17 mm, W:L 71%, AWC; paratype 4. 1.82 x 1.26 mm, W:L 69%, TMC; paratype 5. 1.76 x 1.23 mm, W:L 70%, TMC.

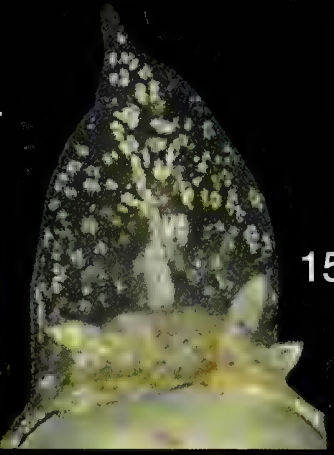
Figures 12-23

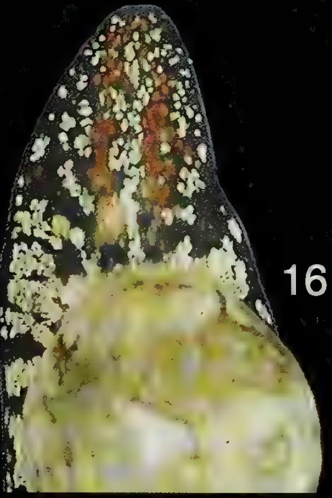
12-15. *Granulina gayracaensis* n. sp. Gayraca Bay, Santa Martha, Colombia, 11°19.5'N, 74°06.3'W, 7 m; **12-13.** Paratype 1. 1.61 x 1.08 mm, W:L 67%, MNHN 21963; **14.** Holotype. 1.75 x 1.22 mm, W:L 70%, MNHN 21962; **15.** Paratype 5. 1.76 x 1.23 mm, W:L 70%, TMC.
16-17. *Granulina cartagenaensis* n. sp. Off Cartagena, Colombia, 10°22.4'N, 75°35.8'W, 25-41 m. Paratype 5. 2.20 x 1.63 mm, W:L 74%, TMC.
18-19. *Granulina waltergomezi* n. sp. Off Isla Chichime, San Blas Archipelago, Panama, 9°37.3'N, 78°53.2'W, 75-95 m. Holotype. 1.47 x 1.16 mm, W:L 79%, MNHN 21989.
20-23. *Granulina iridisa* n. sp. Cabo Codera, Venezuela, 10°35.2'N, 66°03.9'W, 18 m; **20, 22-23.** Holotype. 2.37 x 1.66 mm, W:L 70%, MNHN 21967; **21.** Adult spm. 2.46 x 1.67 mm. W:L 68%.

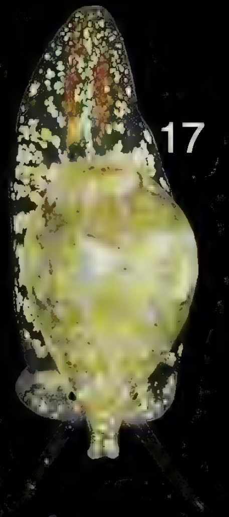

12

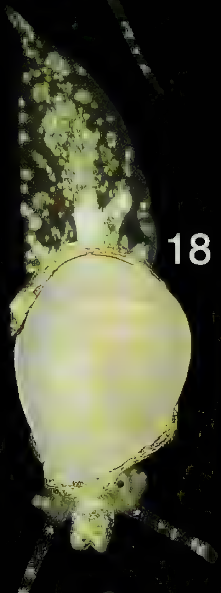

13

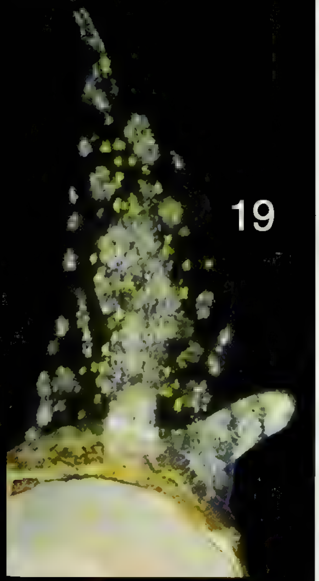

14

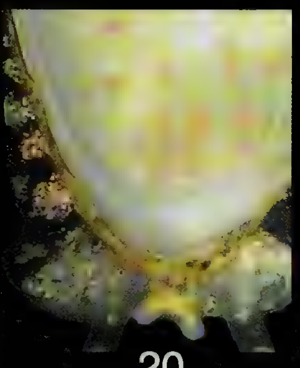

15

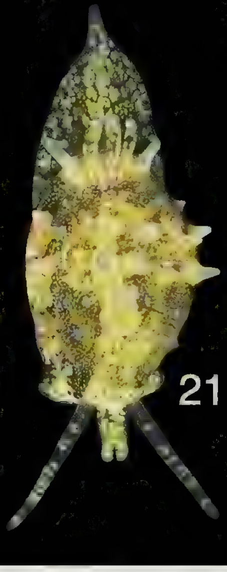

16

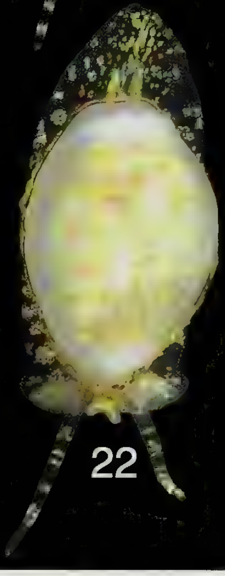

17

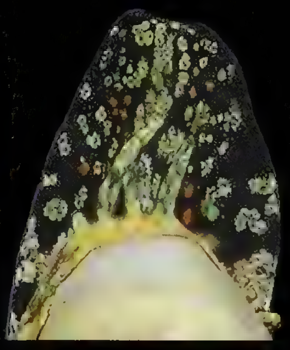

18


19


20


21


22


23

Other material. 21 ad. lv., 18 ad. dd., Gayraca Bay, Santa Martha, Colombia, 11°19.5'N, 74°06.3'W, 7 m, TMC.

Type locality. Gayraca Bay, Santa Martha, Colombia, 11°19.5'N, 74°06.3'W (Map ref. 5).

Description. Shell without colour, oval. Size range 1.61 x 1.08 mm to 1.92 x 1.29 mm, W:L 67-71%. Body whorl semi-transparent, with textured callus wash. Lip evenly curved, curls inwards, wide, widest medially, sixteen irregular, weak denticles almost fill inner edge, weakest anteriorly. In side view lip mainly straight, turns sharply to right posteriorly. External varix strong, very wide, widest medially, raised on dorsum, sweeps around narrow posterior canal, weakening, forms distinct, lumpy callus ridge ventrally, merges with parietal callus ridge. Weakening varix sweeps around wide, rounded anterior canal, merges with first columellar plication and weak anterior callus. Four columellar plications fill approximately 46% of aperture. First weak, small lump on posterior side, medially. Second wide, strongly kinked as it emerges, fades out and merges with anterior callus distally. Third, weak, distal lump with short finger pointing to anterior callus. Fourth weakest with small raised lump distally. Weak, broken parietal callus ridge commences above second plication, irregularly thick. Aperture moderately wide, widens evenly, becoming wide anteriorly. Surfaces of all callus deposits textured with minute pustules.

Animal: Length of fully extended foot slightly less than twice length of shell, width slightly less than shell, semi-transparent lateral marks only partially observed. Metapodium finely elongate distally, pinkish lateral mark almost level with posterior end of shell, believed to have iridescent properties. Smaller irregularly shaped, off-white marks, intermingled with smaller rust and minute black spots posteriorly, concentrated medially forming weak line. Propodium with off-white and pale bluish-grey spots and marks and larger, pale pinkish mark. Semi-transparent tentacles very long, thin, with numerous off-white marks intermingled with some rust marks, distinct rust coloured area basally. Black eyes with off-white annular rings on slight swellings. Siphon long and thick, semi-transparent, many small off-white and rust spots, whiter posteriorly. Mantle: not observed extended, weakly pustulose. Chromatism: generally fine off-white, yellowish-white, rust, pale blue, and black spots and marks. Small pustules with turquoise and white tips. Group of five thin, transparent papillae, posterior medially, densely covered with off-white marks, extended length not observed. Mantle roof: Substantially yellowish-white or pale grey, orange spots and some darker areas. Approximately six indistinct, short, whitish, elongate marks on darker patch emerge from under anterior dorsal callus and fan out posteriorly, pale transverse band located towards posterior, sloping slightly downwards to right, thinly edged with grey posteriorly.

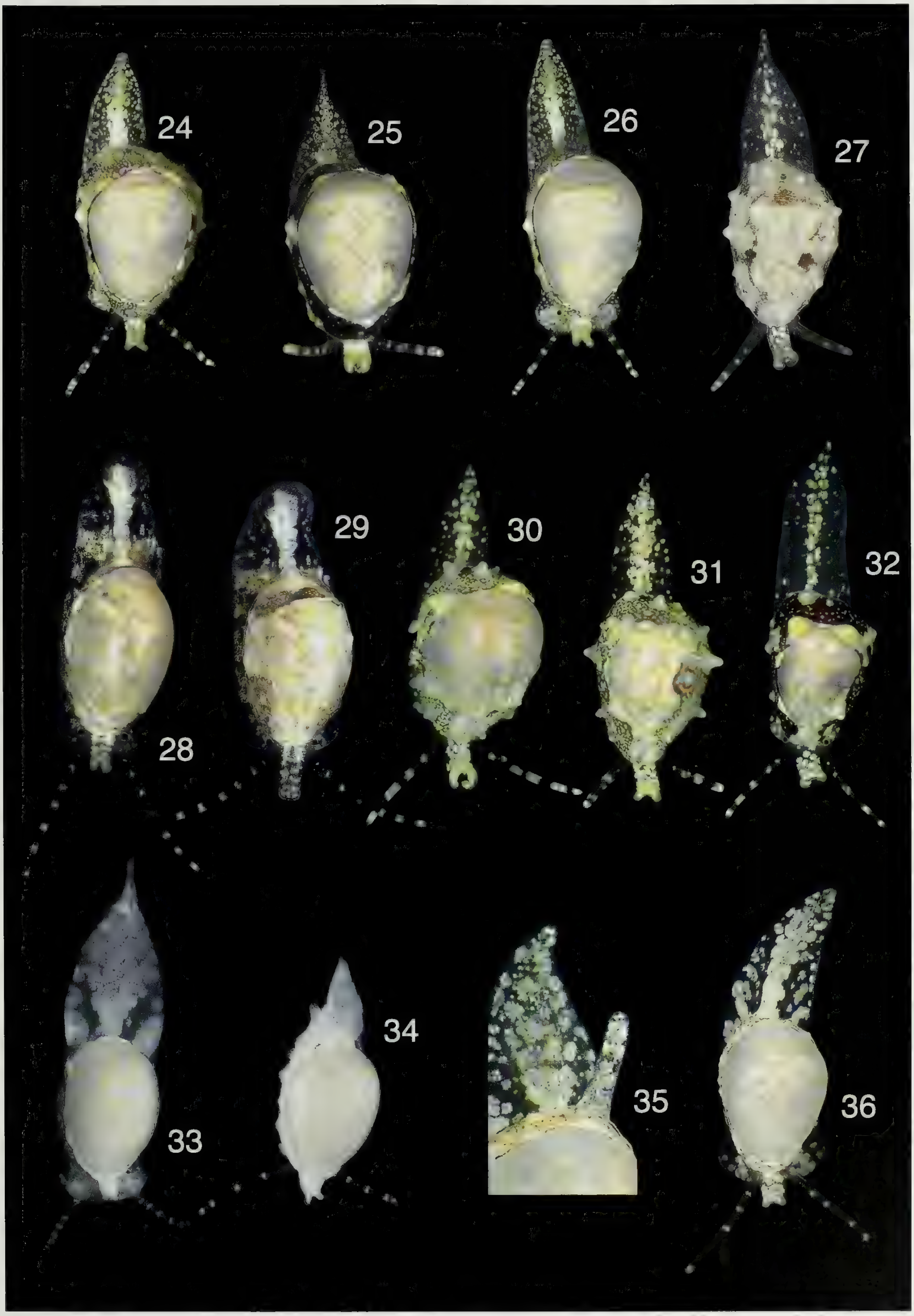
Distribution. Only known from the type locality.

Remarks. *Granulina gayracaensis* n. sp. is closest to *G. ovata* n. sp. with which it is compared. *G. gayracaensis* has a perfectly oval shell, with the widest point located medially, and the W:L 67-71%. *G. ovata,* also a small species, has slightly higher widest point, is less inflated at W:L 64-67%, has a more rounded apex and a more pointed anterior. The most significant difference is the group of five well developed posterior papillae in *G. gayracaensis* which is absent on *G. ovata*. *Granulina gayracaensis* was hand dredged in black sand at 7 m.

Etymology. The name is taken from the type locality.

Figures 24-36

24-26. *Granulina monjesensis* n. sp. Harbour, Monjes del Sur, Venezuela, 12°21.5'N, 70°54.1'W, 3-10 m.
24. Paratype 3. 1.75 x 1.24 mm, W:L 71%, AWC; **25.** Holotype. 1.74 x 1.27 mm, W:L 73%, MNHN 21969; **26.** Paratype 1. 1.68 x 1.20 mm, W:L 71%, MNHN 21970.
27. *Granulina plagula* n. sp. Paratype 1. Boca Grandi, Aruba, 12°27.3'N, 59°52.6'W, 1-2 m.1.80 x 1.20 mm, W:L 67%, MNHN 21980.
28-29. *Granulina ovata* n. sp. Off Isla Cubagua, to north, Venezuela, 10°52.4'N, 64°12.4'W, 22 m; **28.** Holotype. 1.95 x 1.30 mm, W:L 67%, MNHN 21977; **29.** Paratype 1. 2.16 x 1.41 mm, W:L 65%, MNHN 21978.
30-32. *Granulina ocella* n. sp. East Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W, 3 m; **30.** Holotype. 1.52 x 1.12 mm, W:L 74%, MNHN 21973; **31.** Paratype 1. 1.56 x 1.14 mm, W:L 73%, MNHN 21974; **32.** Paratype 2. 1.53 x 1.10 mm, W:L 72%, AWC.
33-34. *Granulina nivalis* n. sp. Las Aves de Sotavento, Venezuela, 12°01.66'N, 067°38.05'W, 1 m;
33. Holotype. 1.62 x 1.15 mm, W:L 71%, MNHN 21971; **34.** Adult spm. 1.73 x 1.27 mm, W:L 74%.
35-36. *Granulina waltergomezi* n. sp. Adult spm. from colony at East Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W, 15-20 m, 1.54 x 1.17 mm, W:L 76%.


24
25
26
27
28
29
30
31
32
33
34
35
36

Granulina cartagenaensis n. sp.

Figs 16-17, 55-57, 96

Type material. Off Cartagena, Colombia, 10°22.4'N, 75°35.8'W, 25-41 m.
Holotype. 2.33 x 1.77 mm, W:L 76%, MNHN 21956; paratype 1. 2.56 x 1.90 mm, W:L 74%, MNHN 21957; paratype 2. 2.74 x 2.05 mm, W:L 75%, AWC; paratype 3. 2.65 x 1.96 mm, W:L 74%, AWC; paratype 4. 2.49 x 1.83 mm, W:L 74%, TMC; paratype 5. 2.20 x 1.63 mm, W:L 74%, TMC.

Other material. 1 ad. dd., 7 juv. dd., off Cartagena, Colombia, 10°22.4'N, 75°35.8'W, 25-41 m, mud, TMC.

Type locality. Off Cartagena, Colombia, 10°22.4'N, 75°35.8'W (Map ref. 4).

Description. Shell without colour, almost globose, posterior very slightly produced. Size range 2.20 x 1.63 mm to 2.74 x 2.05 mm, W:L 74-76%. Body whorl semi-transparent, covered by very thin, lightly textured callus wash. Lip evenly curved, curls inwards, wide, widest medially, narrower with slight concavity posteriorly, slightly flared anteriorly. Fourteen denticles, more widely spaced posteriorly, fill inner edge. In side view, lip straight. External varix strong, wide, wider medially, raised on dorsum. Varix, retaining profile with strong dorsal edge, sweeps around posterior canal, ends abruptly at aperture. Dorsal edge sweeps around as strong ridge, develops into strong lumpy callus ridge ventrally, merges with parietal callus ridge. Callus spreads anteriorly from dorsal edge of varix onto dorsum with moderately well defined margin, fades out ventrally. Varix, weakening somewhat, sweeps around anterior canal, spreads onto dorsum with moderately well defined margin, labial edge merges with slightly raised first columellar plication, dorsal edge continues onto anterior callus as rounded ridge aligned with second plication, fades out at distal end of second plication. Four plications fill approximately one third of aperture, all excavated and without significant kinks. First moderately weak. Second slightly thickened medially, long and pointed distally. Third weak, short, weak lump distally. Fourth weaker, short, very weak lump distally. Anterior callus strong, quickly weakens to light wash at third plication, extends posteriorly as parietal ridge, moderately strong medially. Aperture wide, uniformly wide over entire length. Callus deposits and lip lightly textured with minute pustules.

Animal: Foot at least 65% longer than shell, width approximately same as shell, semi-transparent, approximately eight irregular lateral marks, iridescent, pinkish-white, intermingled with occasional dull reddish-brown spots. Metapodium with smaller off-white marks, becoming progressively smaller and rounder distally. Marks more concentrated medially, giving impression of thin, medial line. Adjacent to medial line, concentrations of reddish-orange spots in two diffuse lines. Two or three reddish-orange spots close to edges, intermingling with whitish spots. Propodium translucent white distally, bearing small whitish marks. Tentacles semi-transparent, moderately long, thin, noticeably tapered, bearing two to four, irregularly spaced, small, bright, white marks. Black eyes with thin whitish, annular rings, located on swellings at base of tentacles. Siphon, semi-transparent, many small off-white spots, orange-red edges at base. Mantle with posterior cap-like area indicative of papillae. Chromatism comprising off-white background with large areas of yellowish-brown, variegated with many slightly different shades including brown, pink, dull red, white; approximately thirty irregularly shaped, slightly raised, light blue spots, being un-inflated pustules. Mantle roof off-white with grey areas.

Distribution. Only known from the type locality.

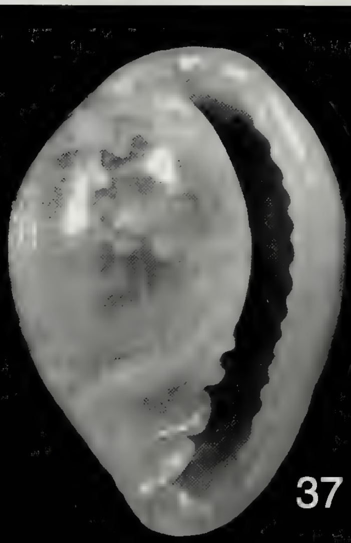
Remarks. *Granulina cartagenaensis* n. sp. is closest to *G. iridisa* n. sp. with which it is compared. These two species have much in common both in shell morphology and animal chromatism, and are probably closely related. The feature which clearly separates them is the is almost globose shell with the W:L ratio of 74-76% which is significantly more inflated than *G. iridisa* with the W:L of 65-70%. Other differences are: in *G. iridisa* the metapodium lacks the diffuse orange-red lines and whitish medial line which is present in *G. cartagenaensis*.

Figures 37-45

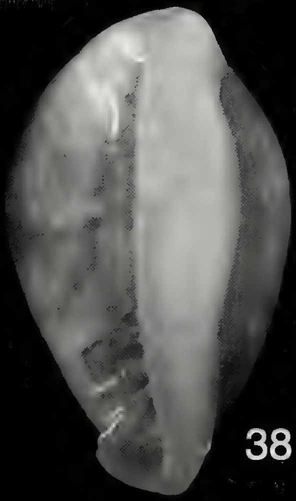
37-39. *Granulina volcana* n. sp. Holotype. Off Islas Los Testigos, to north, Venezuela, 11°28'N, 63°06'W, 73 m. 2.67 x 1.87 mm, W:L 70%, MNHN 21985.

40-42. *Granulina calla* n. sp. Holotype. Isla Grande, Islas Los Testigos, Venezuela, 11°22.8'N, 63°08.1'W, 28 m. 2.57 x 1.75 mm, W:L 68%, MNHN 21954.

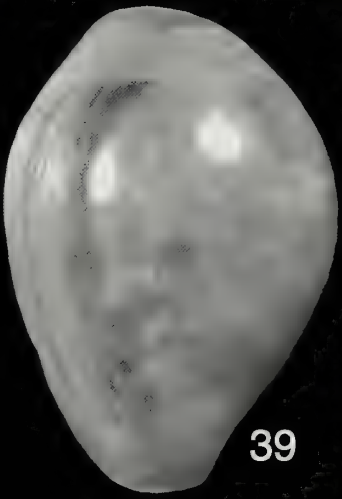
43-45. *Granulina Colonensis* n. sp. Holotype. Off Colon, to east, Panama, 9°31.5'N, 79°52.0'W, 57 m. 1.98 x 1.31 mm, W:L 66%, MNHN 21958.



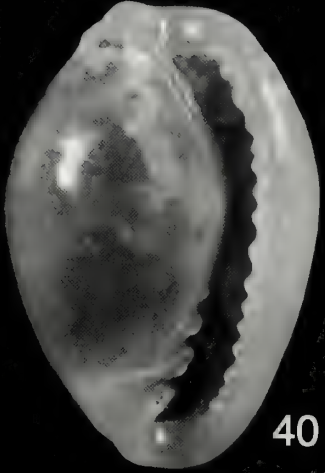
37



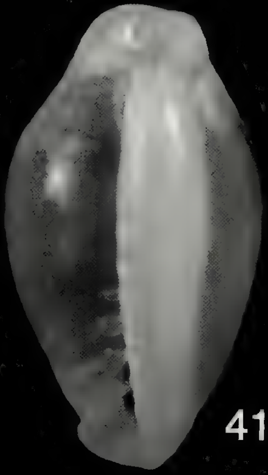
38



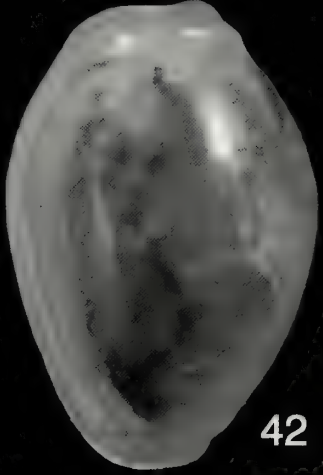
39



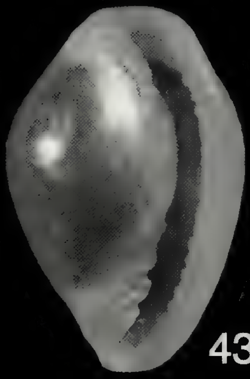
40



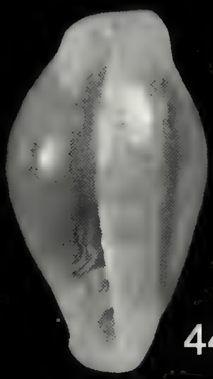
41



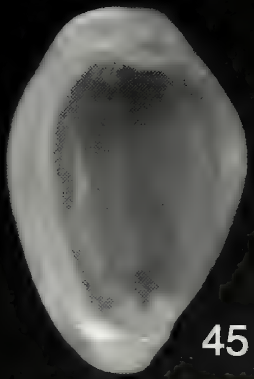
42



43



44



45

It is believed that both *G. cartagenaensis* and *G. iridisa* have similar mantles - strongly pustulose and bearing five posterior papillae (Figs 16-17, and 20-23). Somewhat similar pale blue to turquoise spots are present on mantles of both species: in *G. iridisa* some of these spots can be seen inflated as small pustules while others are not inflated, indicating that their state of inflation is not coincident with the mantle state and may be deliberately controlled by the animal. The cap-like area is also similar in these two species, but in *G. cartagenaensis* it is more substantial. It is hypothesised that this is because the filling elements of un-inflated papillae are contained within, and the area would reduce in volume when papillae are inflated.

Inner whorls and plications can be seen through the semi-transparent dorsum (Fig. 55, 57). The type localities of these two species are approximately 600 miles apart.

Etymology. The name is taken from the type locality.

Granulina waltergomezi n. sp.

Figs 18-19, 35-36, 52-54, 97, 113-116

Type material. Off Isla Chichime, San Blas Archipelago, Panama, 9°37.3'N, 78°53.2'W, 75-95 m. Holotype. 1.47 x 1.16 mm, W:L 79%, MNHN 21989; paratype 1. 1.50 x 1.13 mm, W:L 75%, MNHN 21990; paratype 2. 1.43 x 1.08 mm, W:L 75%, AWC; paratype 3. 1.62 x 1.20 mm, W:L 74%, AWC; paratype 4. 1.51 x 1.14 mm, W:L 75%, TMC; paratype 5. 1.53 x 1.14 mm, W:L 74%, TMC.

Other material. 19 ad. dd., off Isla Chichime, San Blas Archipelago, Panama, 9°37.3'N, 78°53.2'W, 75-95 m; Second colony located East Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W, 15-20 m, sand, six specimens: 1.95 x 1.30 mm, W:L 72%, 1.44 x 1.09 mm, W:L 76%, 1.51 x 1.13 mm, W:L 75%, 1.54 x 1.17 mm, W:L 76%, 1.49 x 1.07 mm, W:L 72 %, 1.48 x 1.11 mm, W:L 75%, and 3 ad. lv. TMC.

Type locality. Off Isla Chichime, San Blas Archipelago, Panama, 9°37.3'N, 78°53.2'W (Map ref. 2).

Description. Shell without colour, globose, slightly produced anteriorly. Size range 1.43 x 1.08 to 1.95 x 1.30 mm, W:L 72-79%. All external surfaces around aperture, including anterior and posterior canals, densely covered by minute, round, flat topped, lumpy deposits on scaly surface. Body whorl semi-transparent, moderately thick callus wash, lightly textured with minute lumps. Lip strongly curved, very strongly posteriorly, strongly curled inwards, moderately wide, widest medially; eighteen somewhat irregular denticles fill inner edge, widely spaced posterior medially, closely spaced anteriorly. Shoulder slightly raised above apex, gently rounded. In side view, lip convex, more so anteriorly. External varix wide, strong, sinuous dorsal edge, widest and slightly raised on dorsum posterior medially, narrows posteriorly, sweeps around posterior canal weakly. Dorsal edge strong, continues around posterior canal widely as ridge below apex, develops into lumpy callus ridge ventrally, merges with parietal callus ridge. Varix narrows, sweeps around siphonal canal creating slightly produced base, blends into first, raised, columellar plication. Four plications fill approximately 43% of aperture. First evenly curved, moderately deep, narrow, raised. Second strong, strongly kinked on projected line of parietal callus ridge, tapering finger extends onto anterior callus and stops abruptly. Third and fourth weak, fourth weakest, both with small distal lump. Second, third and fourth plications weakly excavated. Parietal ridge weak, irregularly lumpy, extends from fourth plication, strengthens slightly posteriorly. Aperture moderately and evenly wide.

Animal: Length of foot at least twice length of shell, narrower, semi-transparent. Metapodium with random small off-white marks, intermingled with yellow and occasional rust spots, concentrated medially forming irregular, wide, distinct medial line on basal half, widening and becoming diffuse, fading distally. Close on each side of line, approximately twelve to fifteen additional yellow spots continue distally. Further off-white, more widely spaced marks extend to lateral edges. Propodium semi-transparent, largely covered by two or three diffuse, off-white marks. Tentacles semi-transparent, long, thin, five or six irregularly spaced marks, strongest distally. Eyes black, located on basal swellings, with diffuse, off-white, annular rings. Siphon short, thick, generally whitish, with many minute off-white, yellow and occasional blacks spots, whiter area basally. Mantle: Only observed in partially extended state. Small areas of off-white, yellowish-brown, reddish-brown and black colours can be detected. One axially located papilla projects posteriorly, with chromatism consisting of minute off-white spots arranged in spiral line wrapped around papilla in three turns, separated by narrow transparent line, rust spots clustered at base. Mantle roof greyish-white with numerous small, pale yellow spots, indistinct, transverse, pale off-white mark located posteriorly, slopes slightly downwards, to right at about 5° off horizontal.

Distribution. Known from the type locality and one other locality at 9°35'N, 078°40'W, 15-20 m, situated inside the islands of the San Blas archipelago, about eight miles to south east.

Remarks. *Granulina waltergomezi* n. sp. is the most inflated *Granulina sp.* to be described from the Caribbean and does not compare closely with any other described species. It is closest to *G. colonensis* n. sp., *G. darienensis* n. sp. and *G. nivalis* n. sp.

Granulina colonensis and *G. darienensis* are considerably larger, considerably less inflated and are colourful animals. *Granulina nivalis* shares somewhat similar shell morphology but is less inflated with W:L 61-71%, the surface texture is very much stronger and more evenly distributed over the entire shell surface (Figs 121-124), the chromatism is strikingly white, and it is a shallow water species.

Etymology. Walter Gomez crewed on the author's yacht during 2007 and 2008 on several expeditions. Many new species were collected and *Granulina waltergomezi* n. sp. is given his name in recognition of his valued help.

Discussion. During preparation of this article *Granulina waltergomezi* n. sp. was suspected of being one of two distinct new species due to differences in shell size, chromatism of the sole papilla and depth of the habitat between two closely related colonies. *Granulina waltergomezi* is a minute species and optical microscopy was unable to clearly show surface texture which was believed to be specific. When S.E.M images became available surface texture was studied closely and it was expected that this would show distinct differences between the two colonies. However, the S.E.M. images showed that the surface texture was somewhat variable but more significantly, these same variations were shared by both colonies. Therefore, the two colonies are now regarded as being the same species. It is probable that these two known colonies of *G. waltergomezi*, which do not interbreed, have not yet evolved to the point where they can described as two distinct species.

Granulina iridisa n. sp.

Figs 20-23, 58-60, 98

Type material. Cabo Codera, Venezuela, 10°35.2'N, 66°03.9'W, 18 m.
Holotype. 2.37 x 1.66 mm, W:L 70%, MNHN 21967; paratype 1. 2.90 x 1.89 mm, W:L 65%, MNHN 21968; paratype 2. 2.62 x 1.81 mm, W:L 69%, AWC; paratype 3. 2.75 x 1.88 mm, W:L 68%, TMC; paratype 4. 2.50 x 1.73 mm, W:L 69%, AWC; paratype 5. 2.43 x 1.67 mm, W:L 69%, TMC.

Other material. 5 ad. lv., 4 ad. dd., Cabo Codera, Venezuela, 10°35.2'N, 66°03.9'W, 18 m; 3 ad. dd., 1 juv. dd., off Cabo Codera, to west, 10°36.1'N, 66°06.0'W, 31 m, TMC.

Type locality. Cabo Codera, Venezuela, 10°35.2'N, 66°03.9'W, 18 m (Map ref. 13).

Description. Shell without colour, obovate. Size range 2.37 x 1.66 mm to 2.90 x 1.89 mm, W:L 65-70%. Body whorl semi-transparent, covered by very light callus wash, without apparent texture. Lip strongly curved, less so medially, curls inwards strongly, wide, widest medially. Eighteen irregularly denticles almost fill inner edge, strongest in posterior half, very weak anteriorly. In side view, edge of lip slightly convex. External varix very strong, wide, wider medially, raised on dorsum, retains profile and sweeps around posterior canal, develops into strong lumpy callus ridge ventrally, merges with parietal callus ridge. Strong callus deposits close to dorsal edge of varix form secondary ridge which sweeps around both posterior and anterior canals, ending at parietal ridge and third columellar plication respectively. Both posterior and anterior ventral callus deposits are strikingly opaque white with clearly defined edges. Labial edge of varix, remaining strong, sweeps around siphonal canal, merges with slightly raised first plication. Four plications fill approximately 40% of aperture, first weak, thin, evenly wide. Second strongest, strongly kinked, strong pointed finger projects from bottom of lump, blends into anterior callus distally. Third strong, short, with distal lump. Fourth weakest with small, rounded, distal lump. Second, third and fourth plication excavated, second weakly. Moderately strong parietal ridge extends posteriorly from plications. Aperture moderately wide, slightly more so anteriorly. Surfaces of all callus deposits textured with minute pustules.

Animal: Length of fully extended foot unknown, width approximately same as shell, semi-transparent with about five irregular shaped marks laterally, anterior marks pinkish, strikingly iridescent. Off-white marks with yellowish hue extend over metapodium; two diffuse red lines extend distally. Propodium substantially off-white with some minute indistinct pinkish spots. Tentacles translucent white, long, thin, with moderately heavy off-white marks, particularly distally. Black eyes located on slight swellings at base of tentacles. Siphon moderately long, semi-transparent with many small off-white spots, intermingled with minute brown spots distally. Mantle with five simple papillae grouped posteriorly on pale cap-like area. The three medial papillae each bear approximately ten yellowish spots, laterals without spots. Mantle chromatism with irregularly shaped pale or dark areas. Pale areas laterally and on closing edges, yellowish with many small brown spots. Dark areas anterior laterally and posteriorly comprised of minute black, dull yellow, orange, dull green spots, and larger, bright turquoise spots which appear to be un-inflated pustules. Inflated pustules pale blue, bright turquoise when not inflated. Mantle roof substantially yellowish-white with pale orange spots. Approximately eleven short, yellow, elongate marks on darker patch emerge from under anterior dorsal callus and fan out posteriorly. Pale, yellowish-white, transverse band located posteriorly, sloping slightly downwards to right.

Distribution. Only known from the type locality and adjoining areas within three mile range to north west.

Remarks. *Granulina iridisa* n. sp. is closest to *G. cartagenaensis* n. sp. (Figs 16-17, 55-57, 96) with which it is compared, and with which it has much in common both in shell morphology and animal chromatism, suggesting that they are closely related. *Granulina cartagenaensis* is slightly smaller, but very significantly more inflated at W:L 74-76%, compared with W:L 65-70% of *G. iridisa*, which alone, separates these two species. Other differences are: the first plication in *G. iridisa* is not excavated; the second is stronger, strongly kinked downwards and points less obliquely downwards (Fig. 98) than *G. cartagenaensis* (Fig. 96); the dorsal callus is considerably heavier, has strikingly opaque white margins which are more clearly defined; lacks the diffuse orange-red lines and whitish medial line present on the metapodium of *G. cartagenaensis*. The type localities of these two species are approximately 600 miles apart.

Etymology. The name refers to the iridescent lateral marks on the foot, *iridis* being the Latin for iridescent.

Granulina monjesensis n. sp.

Figs 24-26, 61-63, 99

Type material. Harbour, Monjes del Sur, Venezuela, 12°21.5'N, 70°54.1'W, 3-10 m.
Holotype. 1.74 x 1.27 mm, W:L 73%, MNHN 21969; paratype 1. 1.68 x 1.20 mm, W:L 71%, MNHN 21970; paratype 2. 1.73 x 1.23 mm, W:L 71%, AWC; paratype 3. 1.75 x 1.24 mm, W:L 71%, AWC; paratype 4. 1.83 x 1.40 mm, W:L 76%, TMC; paratype 5. 1.67 x 1.20 mm, W:L 72%, TMC.

Other material. 6 ad. lv., Harbour, Monjes del Sur, Venezuela, 12°21.5'N, 70°54.1'W, 3-10 m, TMC.

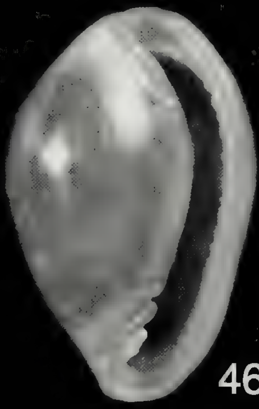
Type locality. Harbour, Monjes del Sur, Venezuela, 12°21.5'N, 70°54.1'W (Map ref. 9).

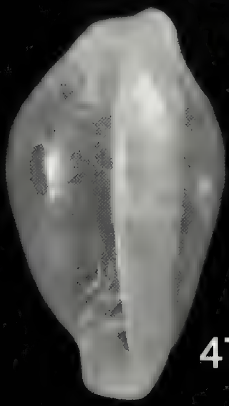
Description. Shell without colour, pyriform. Size range 1.67 x 1.20 mm to 1.83 x 1.40 mm, W:L 71-76%. Dorsum semi-transparent, finely striate, lightly textured. Lip slightly curved anteriorly, very strongly posteriorly, curled inwards, moderately wide, widest posterior medially, twelve weak, irregular denticles on inner edge fade out below labial insertion, very weak anteriorly. In side view, lip convex, more so posteriorly. External varix strong, moderately wide, widest posteriorly, narrow anteriorly. Dorsal edge slightly concave with strong groove, gently rounded shoulder, sweeps around posterior canal, spreads over dorsum as heavy callus, fades ventrally. Weak, uneven, posterior ridge merges with parietal callus ridge. Weakening varix sweeps around wide siphonal canal, merges with anterior callus, labial edge merges into slightly raised first columellar plication. Anterior callus triangular in shape, uneven, heavy, defined by two external edges, one short and strong at first columellar plication, weakening, slopes upwards onto dorsum at approximately 30° to shell axis, second weaker, slopes upwards towards aperture at right-angles to first, merges with parietal ridge (Fig. 61). Four plications fill approximately 36% of aperture; first moderately deep, widening as it emerges, raised. Second strong, strongly kinked, slightly raised as it emerges, wide finger broadly rounded with flat lump distally, extends onto callus. Third weak, emerges as wide, flat lump, tapers finely and fades on anterior callus. Fourth plication can be detected deep within aperture, does not emerge. Parietal ridge irregularly strong, not clearly defined basally, weak medially. All plications excavated, first very weakly. Aperture moderately wide, more so anteriorly. Surface of all callus deposits, including lip, textured.

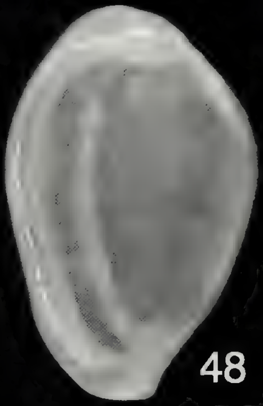
Animal: Foot more than twice shell length, width narrower than shell, semi-transparent. Metapodium with random small yellow-white marks, concentrated medially, forming irregular, strong, distinct, white medial line, extends distally, becoming diffuse and yellowish. Adjacent to medial line, on each side, approximately six dull dark reddish-brown spots intermingled with small yellow-white marks which extend to edges. Edges highlighted by line of small elongated, yellow-white marks. Propodium semi-transparent, covered by fine yellow-white spots. Tentacles semi-transparent, long, thin, five or six irregularly spaced marks distally, diffuse rust marks evident basally. Black eyes with off-white annular rings located on basal swellings. Siphon medium length, thick, semi-transparent, largely covered with fine spots, off-white at base, yellowish distally.

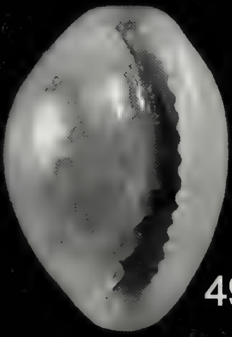
Figures 46-57

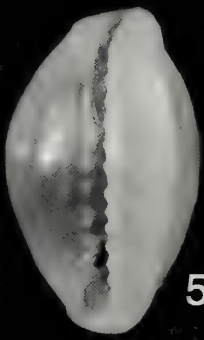
46-48. *Granulina darienensis* n. sp. Holotype. Off Isla Chichime, San Blas, Panama, 9°37.3'N, 78°53.2W, 75 m. 2.14 x 1.39 mm, W:L 65%, MNHN 21960.
49-51. *Granulina gayracaensis* n. sp. Gayraca Bay, Santa Martha, Colombia, 11°19.5'N, 74°06.3'W, 7 m. Holotype. 1.75 x 1.22 mm, W:L 69%, MNHN 21962.
52-54. *Granulina waltergomezi* n. sp. Off Chichime, San Blas Archipelago, Panama, 9°37.3'N, 78°53.2'W, 75-95 m. Holotype. 1.47 x 1.16 mm, W:L 79%, MNHN 21989.
55-57. *Granulina cartagenaensis* n. sp. Off Cartagena, Colombia, 10°22.4'N, 75°35.8'W, 25-41 m. Holotype. 2.33 x 1.77 mm, W:L 76%, MNHN 21956.

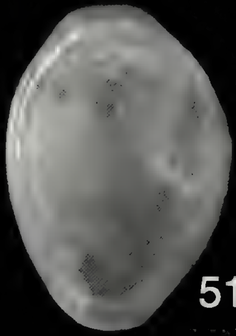

46

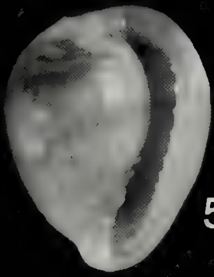

47

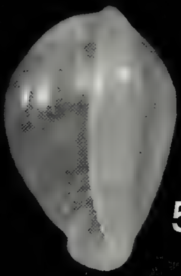

48

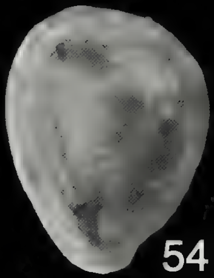

49

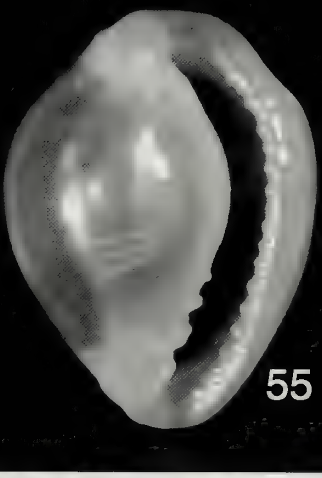

50

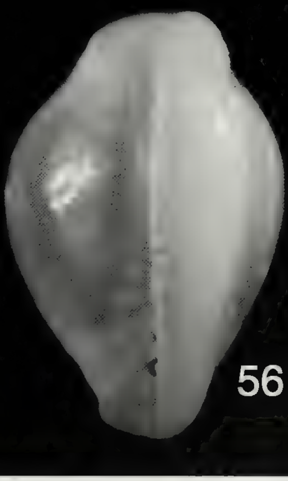

51

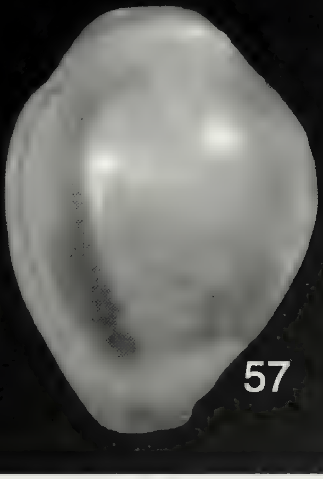

52


53


54


55


56


57

Mantle: Only partially observed, weakly pustulose, chromatism combining many bright colours including turquoise, red, orange yellow, black and white. Melanism is common in this species (Fig. 25). Mantle roof greyish white with numerous small, pale yellow-white and pale orange spots. Indistinct, posterior, transverse, pale, off-white mark, slopes slightly downwards to left at about 5° off horizontal.

Remarks. *Granulina monjesensis* n. sp. is closest to *G. plagula* n. sp. with which it is compared. The shell morphology is somewhat similar, but *G. plagula* has a higher shoulder, aperture widens strongly anteriorly, and the ridge defining the anterior callus is very weak. Other significant differences are present in animals: In *Granulina plagula*, the metapodium is sparsely covered with yellow-white and reddish-brown spots, the mantle is translucent grey-white with occasional dark brown marks and smaller greyish white spots. Some small pale dull orange spots are associated with the dark brown marks. The chromatism of *G. monjesensis* in comprised of considerably smaller spots in bright colours with significant absence of brown.

Distribution. Only known from the type locality.

Etymology. The name is taken from the type locality.

Granulina plagula n. sp.

Figs 27, 64-66, 100

Type material. Boca Grandi, Aruba, 12°27.3'N, 59°52.6'W, 1-2 m.
Holotype. 1.63 x 1.14 mm, W:L 70%, MNHN 21979; paratype 1. 1.80 x 1.20 mm, W:L 67%, MNHN 21980; paratype 2. 1.60 x 1.08 mm, W:L 67%, AWC; paratype 3. 1.68 x 1.13 mm, W:L 67%, AWC; paratype 4. 1.71 x 1.12 mm, W:L 66%, TMC; paratype 5. 1.72 x 1.11 mm, W:L 65%, TMC.

Other material. 95 ad. lv., 10 juv. lv., Boca Grandi, Aruba, 12°27.3'N, 59°52.6'W, TMC.

Type locality. Boca Grandi, Aruba, 12°27.3'N, 59°52.6'W (Map ref. 10).

Description. Shell without colour, obovate. Size range 1.60 x 1.08 mm to 1.80 x 1.20 mm, W:L 65-70%. Dorsum semi-transparent, finely striate, light callus wash, textured. Lip curved, very strongly posteriorly, curled inwards medially, slightly flared anteriorly. Eight weak denticles on inner edge anterior medially, very weak anteriorly, absent posteriorly. In side view, lip evenly convex. External varix wide, widest posteriorly, narrowest anteriorly, dorsal edge almost straight with strong dorsal groove, gently rounded shoulder, weakens, sweeps around posterior canal, widening over dorsum as moderately heavy callus, forms short lumpy ridge ventrally, merges with parietal callus ridge. Weakening varix sweeps around wide, somewhat pointed siphonal canal, merges with anterior callus, labial edge merges with first columellar plication. Four plications fill approximately 39% of aperture; first somewhat uneven in width medially, moderately deep; second stronger, curves anteriorly, extends unusually far onto anterior callus; third narrow, weak, elongate lump distally, curving anteriorly; fourth very weak, distal lump extends anteriorly to join distal lump on third. Parietal ridge extends posteriorly and weakens. Emergent body whorl with very wide callus extending from plications to join posterior callus, margin defined by translucent white line. All plications excavated, first very weakly. Surface of all callus deposits, including lip, textured. Aperture wide posteriorly, less wide medially, widening evenly anteriorly, becoming very wide basally .

Animal: Length of fully extended foot approximately twice length of shell, width narrower. Metapodium elongated distally, irregular yellow-white marks medially forming diffuse medial line, whiter basally, fading distally, otherwise lightly covered with small yellow-white spots intermingled with fewer small reddish-brown spots. Tentacles semi-transparent, long, thin (when fully extended), five off-white marks on distal half, some diffuse rust marks evident basally. Eyes black, on slight basal swellings. Siphon long, moderately thick, semi-transparent, many small off-white and rust spots, whiter posteriorly. Mantle weakly pustulose, translucent pale grey-white, pustules off-white, occasional small off-white marks of various sizes, six or seven large irregular dark brown marks bearing occasional minute, orange-red and off-white spots. Mantle roof only partially observed: background brownish-white with moderately large off-white spots and occasional pale dull orange spots.

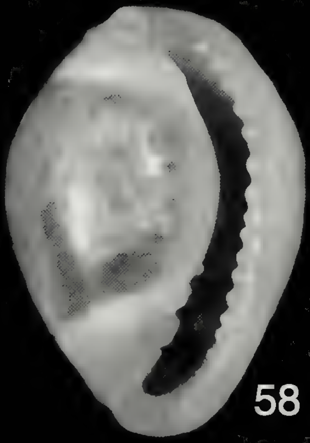
Figures 58-69

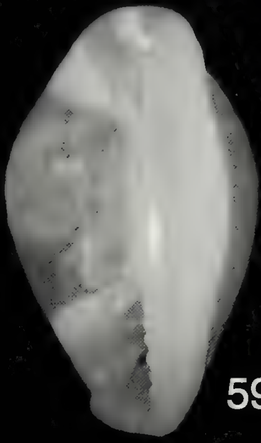
58-60. *Granulina iridisa* n. sp. Cabo Codera, Venezuela, 10°35.2'N, 66°03.9'W, 18 m. Holotype. 2.37 x 1.66 mm, W:L 70%, MNHN 21967.

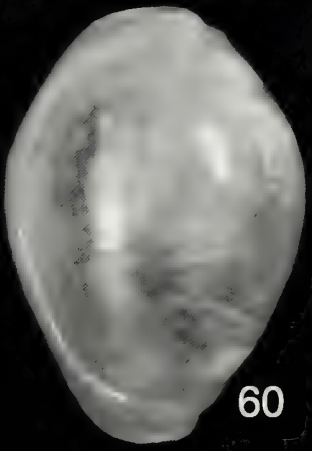
61-63. *Granulina monjesensis* n. sp. Holotype. Harbour, Monjes del Sur, Venezuela, 12°21.5'N, 70°54.1'W, 3-10 m. 1.74 x 1.27 mm, W:L 73%, MNHN 21969.

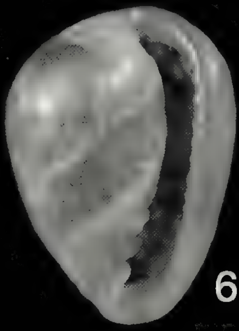
64-66. *Granulina plagula* n. sp. Holotype. Boca Grandi, Aruba, 12°27.3'N, 59°52.6'W, 1-2 m. 1.63 x 1.14 mm, W:L 70%, MNHN 21979.

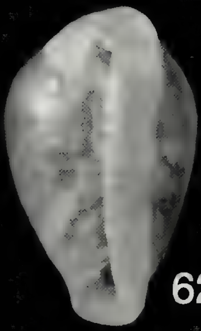
67-69. *Granulina ovata* n. sp. Holotype. Off Isla Cubagua, to north, Venezuela, 10°52.4.'N, 64°12.4'W, 22 m. 1.95 x 1.30 mm, W:L 67%, MNHN 21977.

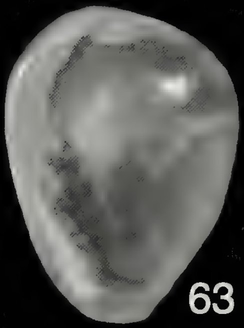

58

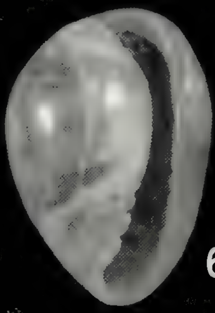

59

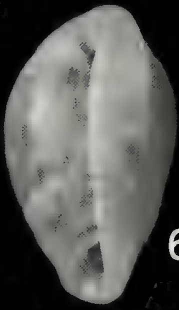

60

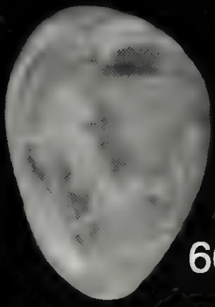

61

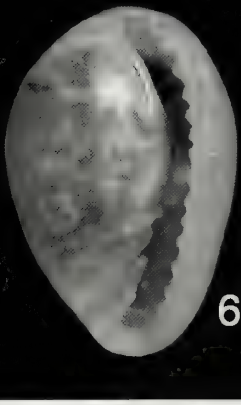

62

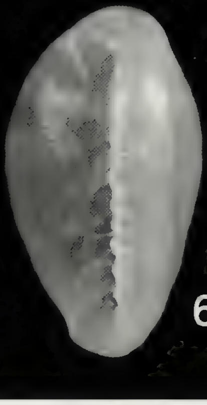

63

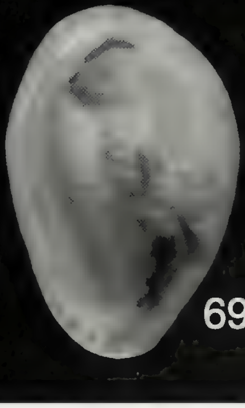

64


65


66


67


68


69

Distribution. Only known from the type locality.

Remarks. *Granulina plagula* n. sp. is close to *G. minae* Espinosa & Ortea, 2000, from Costa Rica but is closer to *G. ocella* n. sp. with which it is here compared. The shell shape of *G. ocella* is somewhat similar, but *G. plagula* is bigger, without any overlap in shell size, and less inflated at W:L 65-70% compared with *G. ocella* at W:L 70-73% - only a slight overlap. Significant differences are: the distal end of second plication in *G. plagula* extends further onto the anterior callus and fades out, callus wash extends clearly onto the dorsum ventrally, the parietal callus ridge is not clearly defined, whereas, in *G. ocella* the second plication is shorter and ends abruptly, the parietal ridge is very straight and clearly defined. Most significantly, the mantle chromatism of *G. plagula* has three large dark brown spots on a translucent grey-white background with some off-white spots, whereas, *G. ocella* has three large, bright ocellated marks with turquoise and orange predominating, on a background of fine, yellowish-white spots intermingled with fine, black spots.

Granulina minae Espinosa & Ortea, 2000, from Costa and *G. guanajatabey* Espinosa & Ortea, 2003, from Cuba, were both compared to *G. antillensis* (De Jong and Coomans, 1988). However, as more Caribbean *Granulina* species are discovered it becomes clear that *G. antillensis* belongs to a different group of *Granulina* species found in deeper water and having shell morphology with slightly produced ends amongst other features. Typical of this group is *G. colonensis* n. sp. (Figs 43-45). Like *Granulina plagula and G. ocella, G. minae* and *G. guanajatabey* are both found in relatively shallow water, down to 15 m. *G. minae* is eliminated from comparison with *G. plagula* by its chromatism which is yellow and orange, and *G. guanajatabey* by its shell shape.

Etymology. The name is taken from the chromatism of the mantle which can be likened to a curtain. The Latin word *plagula* translates as curtain.

Granulina ovata n. sp.

Figs 28-29, 67-69, 101, 129-132

Type material. Off Isla Cubagua, to north, Venezuela, 10°52.4'N, 64°12.4'W, 22 m.
Holotype. 1.95 x 1.30 mm, W:L 67%, MNHN 21977; paratype 1. 2.16 x 1.41 mm, W:L 65%, MNHN 21978; paratype 2. 1.95 x 1.31 mm, W:L 67%, AWC; paratype 3. 2.04 x 1.30 mm, W:L 64%, AWC; paratype 4. 2.08 x 1.35 mm, W:L 65%, TMC; paratype 5. 1.93 x 1.26 mm, W:L 65%, TMC.

Other material. 10 ad. lv., 1 juv. ad., 2 ad. dd., off Isla Cubagua, to north, Venezuela, 10°52.4'N, 64°12.4'W, 22 m; 19 ad. lv. 5 juv. lv., 27 ad. dd., Margarita Channel, off Isla Coche, to north, Venezuela, 11-50 m. mud, TMC (Map ref. 14).

Type locality. Off Isla Cubagua, to north, Venezuela, 10°52.4'N, 64°12.4'W (Map ref. 14).

Description. Shell without colour, ovate, somewhat pointed anteriorly. Size range 1.93 x 1.26 mm to 2.16 x 1.41 mm, W:L 64-67%. Body whorl semi-transparent, slightly striate, moderate callus wash, moderately textured. Lip gently curved, more so posteriorly, curls inwards strongly, wide, slightly wider medially. Fourteen strong, even denticles fill inner edge. In side view, lip, mainly straight, turns sharply to right posteriorly. External varix strong, very wide, widest anterior medially, dorsal edge straight, sweeps to right posteriorly then smoothly around posterior canal without creating shoulder, weakens and forms moderately strong ridge ventrally, merges with parietal callus ridge. Some posterior callus extends from weakening varix over dorsum. Weakening varix sweeps around siphonal canal, merges with weak anterior callus, labial edge merges with weak, very slightly raised first columellar plication. Four plications fill approximately 43% of aperture, all excavated. First moderately strong, thickened medially. Second, wide, flat, short, pointed finger extends from bottom onto anterior callus distally. Third weak, distal lump terminates in short, convex, axial lump forming small curved ridge. Fourth ends abruptly, internally on parietal wall. Posterior edge of anterior callus slightly thickened, sweeps upwards, merges with weak broken, irregularly thick, parietal ridge. Aperture, evenly wide over complete length, curved more strongly posteriorly. Surfaces of all callus deposits textured with minute pustules.

Animal: Foot more than twice shell length, width narrower than shell, semi-transparent. Approximately six pinkish, lateral marks increase in size posteriorly, comprised of diffuse concentrations of minute spots of various colours – off-white, brown, rust, occasional black. Metapodium only observed in rounded state distally. Minute white spots concentrated medially form very strong wide line, widening posteriorly, does not reach to distal end. Area around white medial line lightly marked with minute off-white marks. Propodium semi-transparent, some diffuse off-white marks medially. Tentacles very long, thin, small off-white marks, slightly stronger distally, traces of rust evident at base. Black eyes located on small swellings at base of tentacles. Siphon semi-transparent, almost totally covered by minute off-white marks, whiter at base, strongest laterally. Mantle not observed fully extended, weakly pustulose, one single, translucent, off-white papilla observed (Not figured). Three large, irregularly ocellated marks, grey centres with four rings of dull brownish colours, one located posteriorly, one each side anteriorly, separated by pale areas. Mantle roof substantially yellowish-white or pale grey, many dull orange spots. Pale transverse band located towards posterior, sloping strongly, downwards to right, edged with orange-brown posteriorly.

Distribution. Only known from the type locality.

Remarks. *Granulina ovata* n. sp. is closest to *G. gayracaensis* n. sp. with which it is compared. *Granulina gayracaensis* has perfectly oval shell with a medial widest point, is smaller at 1.61 - 1.92 mm and more inflated at W:L 67-71% than *G. ovata* at 1.93 - 2.16 mm and W:L 64-67%. The plications show small, but significant differences (as described above). The most significant feature separating these two species is the very distinct white, medial line on the metapodium of *G. ovata*, which is absent in *G. gayracaensis* . Presence of papillae on the mantle is omitted from this comparison due to insufficient data being available. Type localities are approximately 750 miles apart.

Etymology. The name refers to the oval shape of the shell, the Latin for oval being *ovatus*.

***Granulina ocella* n. sp.**

Figs 30-32, 73-75,102

Type material. East Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W, 3 m.
Holotype. 1.52 x 1.12 mm, W:L 74%, MNHN 21973; paratype 1. 1.56 x 1.14 mm, W:L 73%, MNHN 21974; paratype 2. 1.53 x 1.10 mm, W:L 72%, AWC; paratype 3. 1.54 x 1.09 mm, W:L 71%, AWC; paratype 4. 1.44 x 1.05 mm, W:L 73%, TMC; paratype 5. 1.53 x 1.07 mm, W:L 70%, TMC.

Other material. Lot of approximately 200 ad. lv., east Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W, 3 m, TMC.

Type locality. East Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W (Map ref. 3).

Description. Shell minute, without colour, pyriform. Size range 1.44 x 1.05 mm to 1.56 x 1.14 mm, W:L 70-74%. Dorsum semi-transparent, occasional striations, light callus wash, lightly textured. Lip gently curved anteriorly and medially, very strongly posteriorly. Curled inwards, moderately wide, less wide posteriorly. Eight weak denticles on anterior half, extremely weak in posterior half. In side view, lip convex, more so posteriorly. External varix wide, widest posteriorly medially, narrowest anteriorly, dorsal edge straight with strong groove, rounded at shoulder, highest above insertion point where it fades out. Callus line present on dorsum close to varix, forms circular deposit around immersed spire. Further light callus spreads around posterior canal and forms ridge ventrally to merge with parietal callus ridge. Weakening varix sweeps around wide siphonal canal, merges with weak anterior callus, labial edge merges with raised first columellar plication. Four plications fill approximately 33% of aperture. First wide, deep. Second wide, close to first with deep, clearly defined grove between, widened at distal lump causing bifurcation, stops abruptly on anterior callus. Third deeply excavated, small distal lump angled downwards, almost touches second. Fourth discontinuous due to very deep excavation, small distal lump merges with very straight, clearly defined but lumpy, parietal ridge. Surface of all callus deposits textured. Aperture moderately wide, slightly wider anteriorly.

Animal: Foot more than twice shell length, width narrower, semi-transparent. Metapodium with small, yellow-white marks, concentrated to form irregular, diffuse medial line extending distally. Adjacent to centre line, six dark reddish-brown spots, intermingled with small yellow-white marks extending to edges. Propodium semi-transparent, covered by five or six yellow-white spots. Tentacles semi-transparent, long, thin, five or six irregularly spaced marks strongest distally, diffuse rust marks evident basally. Eyes black, located on basal swellings, off-white annular rings. Siphon medium length, thick, semi-transparent, largely covered with off-white spots, yellowish-white distally, intermingled with occasional minute, dull reddish-brown spots, less so at base. Mantle: Sparsely pustulose, two larger pustules located posteriorly on closing edge of mantle, background yellow-white. Main feature of chromatism: three broadly round, large, ocellated spots, turquoise centre encircled by thin black ring, wider orange ring and further thin black ring. Three or four less distinct marks located randomly, all separated by minute yellow-white and black spots. Melanism is common in this species (Fig. 32). Mantle roof greyish white with numerous small, pale yellow-white and pale orange spots. Indistinct, posterior, transverse, pale off-white mark slopes slightly downwards to right at about 5° off horizontal.

Remarks. *Granulina ocella* n. sp. is compared with *G. minae* Espinosa & Ortea, 2000, from Costa Rica to which it appears to be closely related. The shells of both species are pyriform, but *G. minae* is somewhat more pointed. The main differences are in the animal chromatism: *G. ocella* exhibits three striking turquoise ocellated spots which are absent in *G. minae,* and *G. minae* exhibits a number of yellow longtitudinal grooves on the anterior part of the mantle roof; a posterior snow white pustule on the mantle amongst others which are yellow; the overall colour is mainly yellow. All these features differ from *G. ocella.*

Distribution. Only known from the type locality.

Etymology. The name refers to the brightly coloured spots on the mantle which are likened to an eye or gem, for which the Latin is *ocellus.*

Granulina nivalis n. sp.
Figs 33-34, 76-78, 103, 121-124, 136-141

Type material. Las Aves de Sotavento, Venezuela, 12°01.66'N, 067°38.05'W, 1 m.
Holotype. 1.62 x 1.15 mm, W:L 71%, MNHN 21971; paratype 1. 1.72 x 1.17 mm, W:L 68%, MNHN 21972; paratype 2. 1.69 x 1.21 mm, W:L 71%, AWC; paratype 3. 1.39 x 0.98 mm, W:L 71%, AWC; paratype 4. 1.41 x 0.96 mm, W:L 68%, TMC; paratype 5. 1.70 x 1.17 mm, W:L 69%, TMC.

Other material. 4 spms: 1.72 x 1.18, W:L 69%, 1.74 x 1.16, W:L 67%, 1.75 x 1.19, W:L 68%, 1.78 x 1.22 mm W:L 68%, and approximately 40 additional spms. from numerous stations within type locality, TMC.

Type locality. Las Aves de Sotavento, Venezuela, 12°01.66'N, 067°38.05'W (Map ref. 12).

Description. Shell without colour, ovate, surface dull. Size range 1.39 x 0.98 mm to 1.78 x 1.22 mm, W:L 67-71%. Body whorl translucent white. All external surfaces densely textured. Lip evenly curved, strongly curled inwards, wide, fifteen strong, denticles, slightly more widely spaced medially, fill inner edge. In side view, lip convex, more so posteriorly. External varix wide, moderately strong, widest medially, dorsal edge straight, gradually narrows and sweeps around posterior canal, fades out ventrally as weak lumpy ridge, merges with parietal callus ridge. Weakening varix sweeps around evenly curved siphonal canal, blends into anterior callus; labial edge merges with first columellar plication. Four plications fill approximately 42% of aperture, all moderately excavated. First plication narrow with small raised lump. Second strong, strongly kinked at lump on emergent end, short, weak finger blends distally into anterior callus. Third strong, short, with distal lump. Fourth does not emerge, almost imperceptible lump externally. All lumps on plications aligned with smooth, parietal ridge extending posteriorly from plications. Surface of shell covered with deposit of minute roundish lumps (Figs 121-124), some axial alignment apparent. Aperture moderately wide, slightly wider anteriorly.

Animal: Length of foot more than twice shell length, width narrower, metapodium widening before narrowing and tapering to very narrow, elongate point distally. Chromatism of external parts: almost totally white, white marks on translucent foot, marks being largest laterally and medially on emergent metapodium, smaller and diffuse on remainder. Propodium with white diffuse marks. Tentacles semi-transparent, long, thin, four to six white marks spaced along length, small brown marks basally. Eyes located on slight basal swellings, black with weak, white annular rings. Siphon short, white, thick (possibly not observed fully extended). Mantle: not observed extended, several un-inflated lateral, white swellings evident, indicating that mantle is pustulose. One moderately long, posterior pustule evident (it is not known if this can extend to become a long papilla). One small distinct brownish mark on posterior edge. Mantle roof white with numerous very pale brownish orange spots.

Distribution. Only known from the type locality.

Habitat. Sand on and close to dead coral rocks and rubble in shallow water to 3 m.

Remarks. *Granulina nivalis* n. sp. appears to be most closely related to *G. ovata* n. sp. with which it is compared. Shell morphology is similar, but the shell surface of *G. ovata* is significantly less textured and the shell is significantly bigger: size range 1.93 x 1.26 mm to 2.16 x 1.41 mm, W:L 64-67%, compared to *G. nivalis* with size range 1.39 x 0.98 mm to 1.78 x 1.22 mm, W:L 67-71%. Animal chromatism is significantly different: *G. ovata* is strongly coloured compared to the unusually white chromatism of *G. nivalis*.

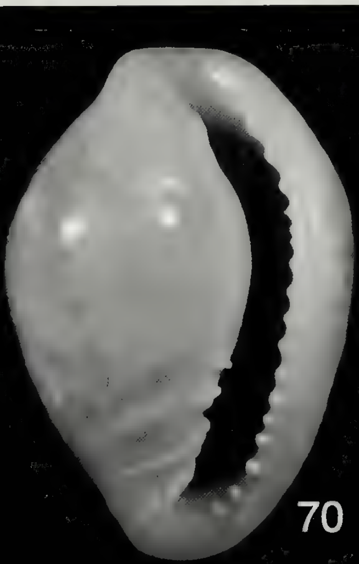
Etymology. The name refers to the snow white chromatism and snow-like pattern on the metapodium, and is taken from the Latin word *nivalis* meaning snowy.

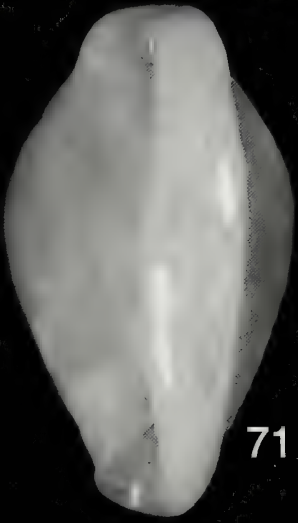
Granulina velaensis n. sp.
Figs 70-72, 104

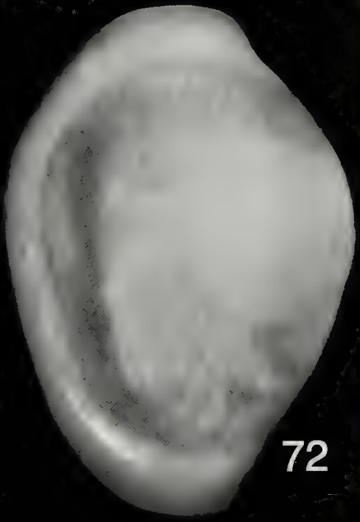
Type material. Off Cabo de Vela, Colombia, 11°57'N, 72°36'W, 58 m.
Holotype. 2.80 x 1.94 mm, W:L 69%, MNHN 21987; paratype 1. 2.82 x 1.94 mm, W:L 69%, MNHN 21988; paratype 2. 2.77 x 1.84 mm, W:L 66%, AWC; paratype 3. 2.83 x 2.00 mm, W:L 71%, AWC; paratype 4. 3.24 x 2.12 mm, W:L 66%, TMC; paratype 5. 2.46 x 1.63 mm, W:L 66%, TMC.

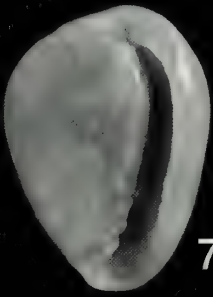
Figures 70-81

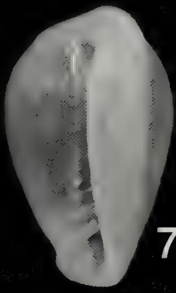
70-72. *Granulina velaensis* n. sp. Holotype. Off Cabo de Vela, Colombia, 11°57'N, 72°36'W, 58 m. 2.80 x 1.94 mm, W:L 69%, MNHN 21987.
73-75. *Granulina ocella* n. sp. Holotype. East Holandes Cays, San Blas, Panama, 9°35'N, 078°40'W, 3 m. 1.52 x 1.12 mm, W:L 74%, MNHN 21973.
76-78. *Granulina nivalis* n. sp. Holotype. Las Aves de Sotavento, Venezuela, 12°01.66'N, 067°38.05'W, 1 m, 1.62 x 1.15 mm, W:L 71%, MNHN 21971.
79-81. *Granulina pinguisa* n. sp. Holotype. Off Cabo de Vela, Colombia, 12°06.7'N 72°19.3'W, 50-59 m. 2.02 x 1.53 mm, W:L 76%, MNHN 21975.

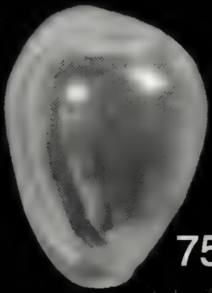

70

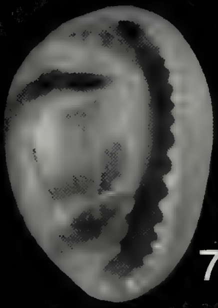

71

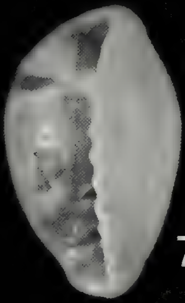

72

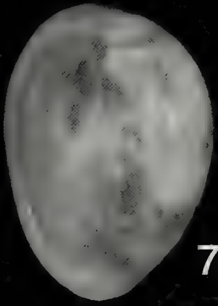

73

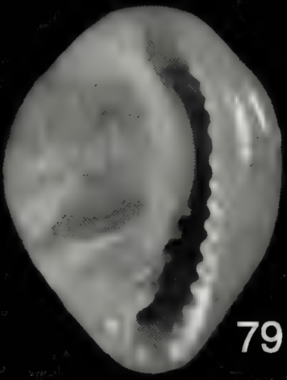

74

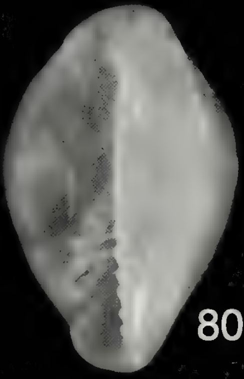

75

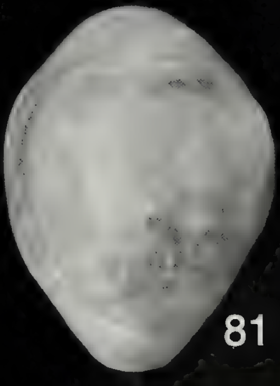

76


77


78


79


80


81

Other material. Lot of 100 plus ad. dd., off Cabo de Vela, Colombia, 11°57'N, 72°36'W, 58 m, TMC.

Type locality. Off Cabo de Vela, Colombia, 11°57'N, 72°36'W (Map ref. 7).

Description. Shell without colour, obovate, slightly produced at both ends. Size range 2.46 x 1.63 mm to 3.24 x 2.12 mm, W:L 66-71%. Body whorl semi-transparent, dorsum unusually striate posteriorly, covered by light callus wash with light texture. Lip gently curved, slightly more so posterior medially, curls inwards strongly, wide, more so medially, eighteen irregular denticles completely fill inner edge, more widely spaced posteriorly. In side view, lip slightly sinuous. External varix wide, extremely strong, only slightly raised on dorsum, sweeps around wide, posterior canal, forms lumpy posterior callus ridge, merges with moderately strong parietal callus ridge. Varix remains strong, sweeps around weak siphonal canal, merges into strong, wide anterior callus, labial edge weakens, merges with slightly raised, first columellar plication. Four plications fill approximately 38% of aperture. All plications slightly excavated. First moderately deep and narrow, slightly kinked medially. Second strongest, slightly kinked at wide, elongated lump, long tapering finger distally fades out on strong anterior callus. Third weaker, short with pointed distal lump. Fourth weakest, short with pointed distal lump. Moderately strong, wide parietal ridge commences at third plication. Aperture wide, slightly more so anteriorly. Surfaces of all callus deposits, and lip, textured with minute pustules.

Distribution. Only known from the type locality.

Remarks. No live animals were collected. Shell morphology indicates that *Granulina velaensis* n. sp. is closest to *G. iridisa* with which it is compared. *Granulina velaensis* is approximately 10 % larger and similarly inflated, unusually striate, particularly posteriorly, and more heavily textured. The most significant differences are the unusually strong external varix, slightly produced and wider posterior, and more flared siphonal canal compared to the medially widened varix which is more extensively raised on the dorsum, and the distinctive form of callus deposits on the emergent body whorl of *G. iridisa*. (Figs 58-60). Type localities are approximately 380 miles apart.

Etymology. The name is taken from the type locality.

Granulina pinguisa n. sp.

Figs 79-81, 105

Type material. Off Cabo de Vela, Colombia, 12°06.7'N 72°19.3'W, 50-59 m.
Holotype. 2.02 x 1.53 mm, W:L 76%, MNHN 21975; paratype 1. 1.77 x 1.30 mm, W:L 74%, MNHN 21976; paratype 2. 1.75 x 1.24 mm, W:L 71%, AWC; paratype 3. 1.86 x 1.40 mm, W:L 75%, AWC; paratype 4. 1.74 x 1.23 mm, W:L 71%, TMC; paratype 5. 1.83 x 1.31 mm, W:L 72%, TMC.

Other material. 4 ad. dd., off Cabo de Vela, Colombia, 12°06.7'N, 72°19.3'W, 50-59 m; 3 ad. dd., 1 juv., dd., off Cabo de Vela, Colombia, 11°57'N, 72°36'W approximately, 38-69 m; 19 ad. dd., 2 juv. dd., off Cabo de Vela, Colombia, 12°00.4'N, 72°31.9'W, TMC.

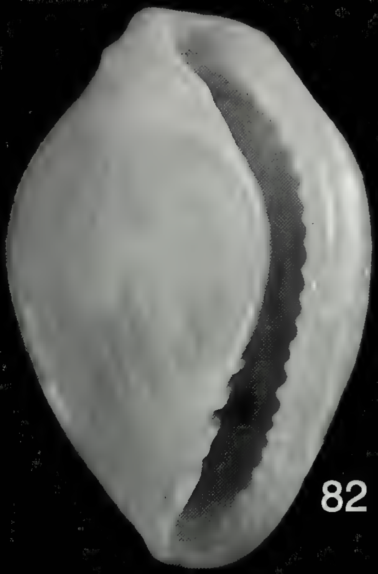
Type locality. Off Cabo de Vela, Colombia, 12°06.7'N, 72°19.3'W, 50-59 m. (Map ref. 8).

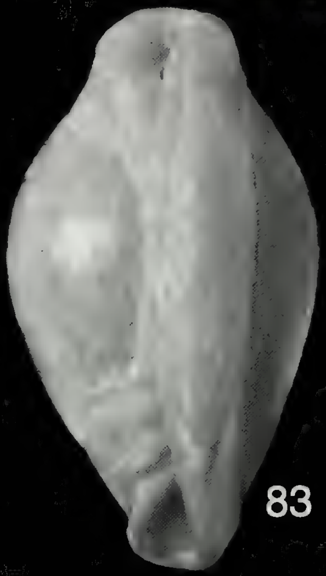
Description. Shell without colour, globose, very slightly biconic, very solid. Size range 1.86 x 1.40 mm to 2.02 x 1.53 mm, W:L 71-76%. Body whorl semi-transparent, with light callus wash, lightly textured. Lip gently curved, extremely wide, curls very strongly inwards. Fourteen irregular denticles completely fill inner edge, widely spaced posteriorly. In side view, lip almost straight except extreme posterior end which turns to right. External varix, very wide medially, less so posteriorly, narrow anteriorly, strongly raised on dorsum, weakens at gently curved apex, moderately strong callus with straight transverse edge extends onto dorsum. Weakening varix and dorsal callus continue around posterior canal forming short ventral ridge to merge with parietal callus ridge. Varix weakens, sweeps

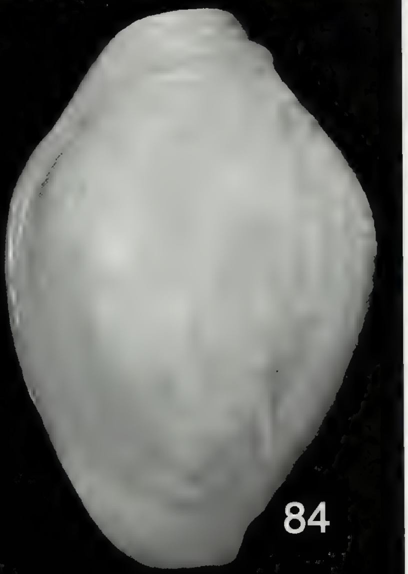
---

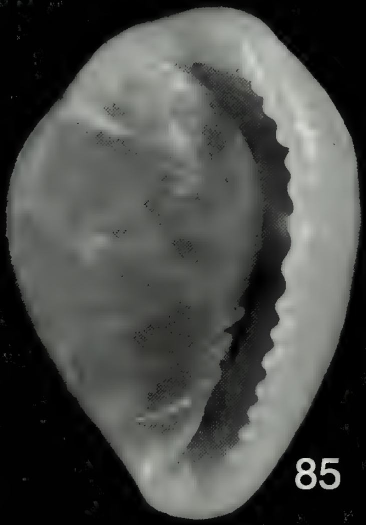
Figures 82-90

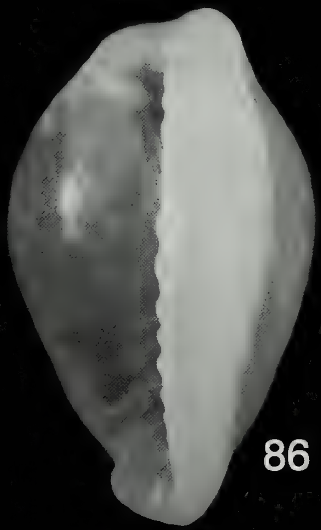
82-84. *Granulina granatensis* n. sp. Holotype. Off Santa Martha, Colombia, 11°18.0'N, 74°12.2'W, 90-101 m. 3.05 x 2.02 mm, W:L 66%, MNHN 21964.
85-87. *Granulina tobagoensis* n. sp. Holotype. Off Tobago, to north, Trinidad and Tobago,11°16'N, 60°49'W, 86 m. 2.79 x 2.01 mm, W:L 72%, MNHN21983.
88-90. *Granulina producera* n. sp. Holotype. Off Piscadera Bay, Curaçao, 12°07.5'N, 68°58.5'W, 130 m. 2.22 x 1.30 mm, W:L 59%, MNHN 21981.

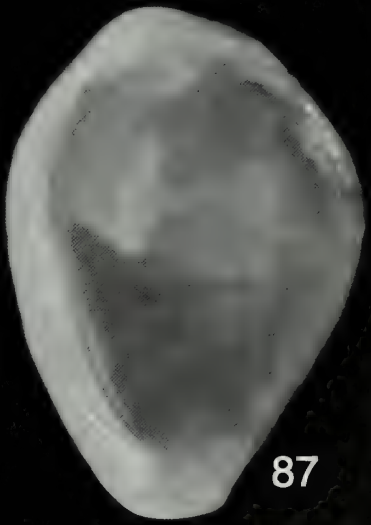

82

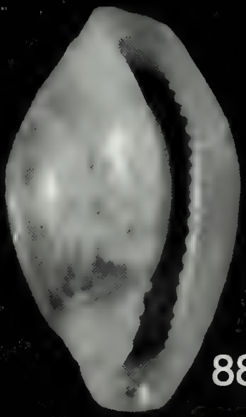

83

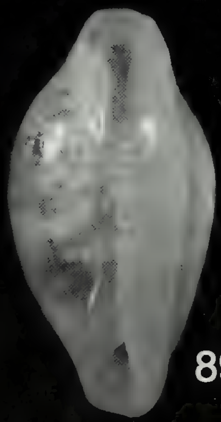

84

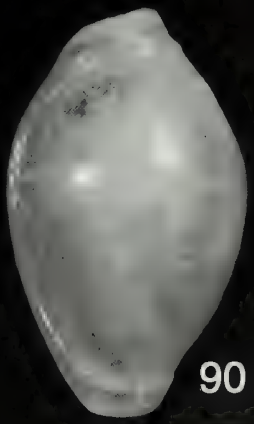

85


86


87


88


89


90

around weak siphonal canal, merges with wide anterior callus. Labial edge joins raised first columellar plication. Four plications fill approximately 45% of aperture. All plications excavated. First weak, narrow, slightly kinked and swollen medially. Second weak, widened externally, slightly kinked downwards, rather short, bifurcated distally. Third and fourth stop abruptly in aperture before excavation, both have small external lump. Parietal ridge strong, smooth, unusually remote from aperture, commences at third plication. Aperture wide at ends, narrower medially, parietal wall strongly curved. Surfaces of all callus deposits textured with minute pustules.

Distribution. Only known from the type locality and stations in adjoining area to 12°06.7'N, 72°19.3'W, approximately twenty miles apart.

Remarks. Only dead shells were collected. *Granulina pinguisa* n. sp. is very solid, inflated, and unlike any other described Caribbean *Granulina*. It is closest to *G. cartagenaensis* n. sp. with which it is compared. *Granulina pinguisa* averages less that 2 mm in shell length, compared with over 2.5 mm for *G. cartagenaensis*, W:L ratios are similar. Significant differences are present in the plications: in *G. cartagenaensis* they fill one third of the aperture, and the second is very long distally. In *G. pinguisa* plications fill approximately 45% of the aperture and all are shorter. The most significant difference is the extremely wide, very strongly curled in lip of *G. pinguisa*. These two species can be separated by any one of these features.

Granulina ovuliformis d'Orbigny, 1842, should also be mentioned here as the name suggests an inflated shell shape. The original description of *G. ovuliformis* includes the statements that the shell is narrow anteriorly and wide posteriorly, and the aperture extends beyond the length of the shell, the same as the lip. These features are found in many undescribed *Granulina spp.*, but are not applicable to G. pinguisa.

Etymology. The name reflects the solid appearance of this species and is taken from the Latin word *pinguis* meaning gross.

Granulina granatensis n. sp.

Figs 82-84, 106

Type material. Off Santa Martha, Colombia, 11°18.0'N, 74°12.2'W, 90-101 m.
Holotype. 3.05 x 2.02 mm, W:L 66%, MNHN 21964; paratype 1. 2.59 x 1.73 mm, W:L 67%, MNHN 21965; paratype 2. 2.55 x 1.77 mm, W:L 69%, AWC; paratype 3. 2.48 x 1.69 mm, W:L 68%, AWC; paratype 4. 2.74 x 1.79 mm, W:L 65%, TMC; paratype 5. 2.66 x 1.81 mm, W:L 68%, TMC.

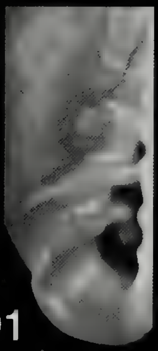
Other material. 7 ad. lv., 5 ad dd., 2 juv. dd., off Santa Martha, Colombia, 11° 18'N, 74°12'W, 46-99 m TMC.

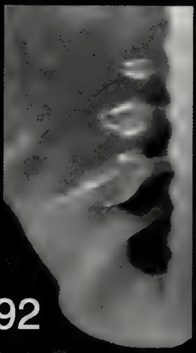
Type locality. Off Santa Martha, Colombia, 11° 18.0'N, 74°12.2'W (Map ref. 6).

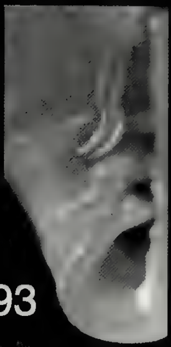
Description. Shell without colour, obovate, slightly produced at both ends. Size range 2.48 x 1.69 mm to 3.05 x 2.02 mm, W:L 65-69%. Body whorl semi-transparent, dorsum slightly striate, covered by light callus wash with fine texture. Lip gently curved, wide, slightly more so medially, strongly curled inwards, completely filled by nineteen denticles, widely spaced posteriorly. In side view, lip slightly convex, more so anteriorly. External varix moderately strong, dorsal edge almost straight, maintains profile, sweeps tightly around narrow posterior canal, drops down steeply as lumpy ridge, merges with parietal callus ridge. Strong secondary ridge associated with dorsal edge of varix curves completely around dorsum, slightly below apex, merges with parietal callus ridge. Varix sweeps around siphonal canal, merges with weak anterior callus. Labial edge merges with raised, very strong first columellar plication. Four strong plications fill approximately 37% of aperture. All slightly excavated. First moderately deep, narrow swelling on posterior side medially. Second sinuous, thickened, kinked downwards as it emerges, merges with anterior callus. Third with pointed distal lump pointing downwards. Fourth with substantial distal lump pointing downwards, fading, joins third distally.

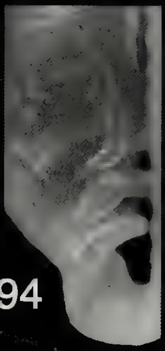
Figures 91-108

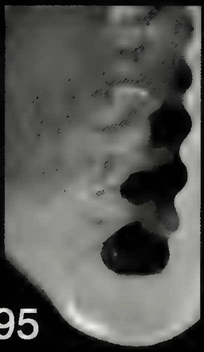
91. *Granulina volcana,* holotype, 2.67 x 1.87 mm, W:L 70%; **92.** *Granulina calla,* holotype, 2.57 x 1.75 mm, W:L 68%; **93.** *Granulina colonensis,* holotype, 1.98 x 1.31 mm, W:L 66%; **94.** *Granulina darienensis,* holotype, 2.14 x 1.39 mm, W:L 65%; **95.** *Granulina gayracaensis,* paratype 3, 1.6 4 x 1.17 mm, W:L 71%; **96.** *Granulina cartagenaensis,* holotype, 2.33 x 1.77 mm, W:L 76%; **97.** *Granulina waltergomezi,* holotype, 1.47 x 1.16 mm, W:L 79%; **98.** *Granulina iridisa,* holotype, 2.37 x 1.66 mm, W:L 70%; **99.** *Granulina monjesensis,* holotype, 1.74 x 1.27 mm, W:L 73%; **100.** *Granulina plagula,* holotype, 1.63 x 1.14 mm, W:L 70%; **101.** *Granulina ovata,* holotype, 1.95 x 1.30 mm, W:L 67%; **102.** *Granulina ocella,* paratype 1, 1.56 x 1.14 mm, W:L 73%; **103.** *Granulina nivalis,* holotype, 1.62 x 1.15 mm, W:L 71%; **104.** *Granulina velaensis,* paratype 1, 2.82 x 1.94 mm, W:L 69%; **105.** *Granulina pinguisa,* holotype, 2.02 x 1.53 mm, W:L 76%; **106.** *Granulina granatensis,* holotype, 3.05 x 2.02 mm, W:L 66%; **107.** *Granulina tobagoensis,* paratype 4, 2.80 x 1.97 mm, W:L 70%; **108.** *Granulina producera,* holotype, 2.22 x 1.30 mm, W:L 59%.

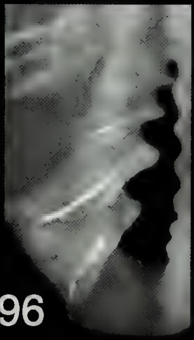

91

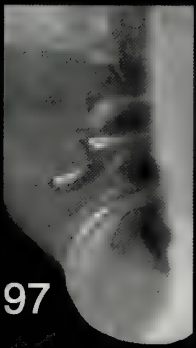

92

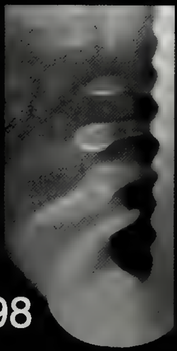

93

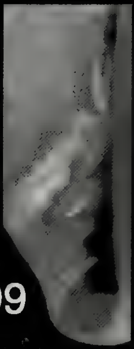

94

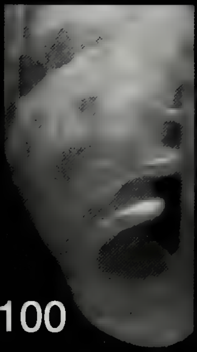

95

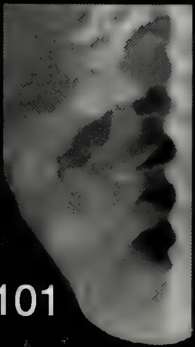

96

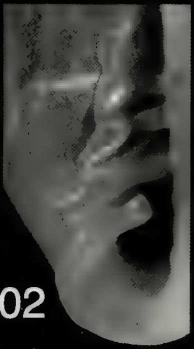

97


98

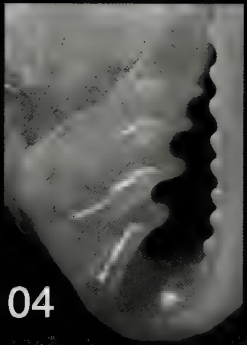

99

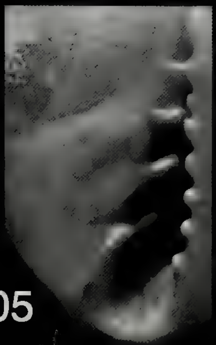

100

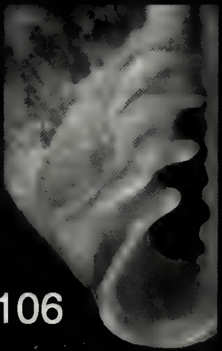

101

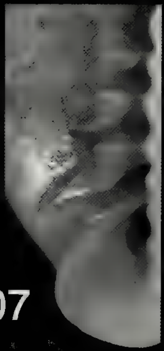

102

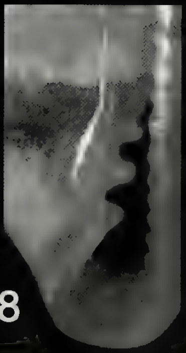
103


104


105


106


107


108

Parietal ridge weak, commences above fourth plication, extends posteriorly. Aperture moderately wide, less so medially. Surfaces of all callus deposits, textured with minute pustules.

Distribution. Only known from the type locality.

Remarks. Seven live animals of *Granulina granatensis* n. sp. were collected but died before imaging, therefore, specific assessment is based solely on the shell morphology. *Granulina granatensis* is closest to *G. velaensis* with which it is compared. Holotypes of both species are mature shells, therefore, the callus deposits of each are considered to accurately represent each species. *Granulina granatensis* is a more heavily callused species than *G. velaensis* (Figs 70-72, 104). Callus deposits are particularly heavy posteriorly where a strong secondary ridge curves completely around the dorsum, slightly below the apex – absent in *G. granatensis*. Plications are deeper, angled downwards distally, the third and fourth tend to join together. *G. velaensis* has a very strong external varix with a very strong dorsal edge, but this does not result in a secondary posterior callus ridge. The third and fourth plications point straight outwards from the aperture with no tendency to merge.

Etymology. The name is taken from Granate Bay, close to the type locality.

***Granulina tobagoensis* n. sp.**

Figs 85-87, 107, 125-128, 133-135

Type material. Off Tobago, to north, Trinidad and Tobago,11°16'N, 60°49'W, 86 m.
Holotype. 2.79 x 2.01 mm, W:L 72%, MNHN 21983; paratype 1. 2.59 x 1.83 mm, W:L 71%, MNHN 21984; paratype 2. 3.18 x 2.24 mm, W:L 70%, AWC; paratype 3. 3.38 x 2.42 mm, W:L 72%, AWC; paratype 4. 2.80 x 1.97 mm, W:L 70%, TMC; paratype 5. 3.42 x 2.46 mm, W:L 72%, TMC.

Other material. Approximately 500 shells, off N. W. Tobago, Trinidad and Tobago, at various stations in area around 11°16'N, 60°49'W, 73-86 m, TMC.

Type locality. Off N. W. Tobago, Trinidad and Tobago, 11°16'N, 60°49'W, 86 m (Map ref. 17).

Description. Shell without colour, weakly pyriform, lightly textured. Size range 2.59 x 1.83 mm to 3.42 x 2.46 mm, W:L 70-72%. Body whorl semi-transparent, light callus wash, slightly striate. Lip curved, more so posteriorly, wide, widest medially, curls inwards strongly. Fifteen denticles completely fill inner edge, widely spaced posteriorly. In side view, lip slightly convex. External varix strong, wide, widest medially, dorsal edge convex, raised slightly on dorsum, sweeps around slightly flared posterior canal, forms short, strong, lumpy callus ridge ventrally, merges with parietal callus ridge. Dorsal edge of varix sweeps around posterior canal at lower level, forming strong ridge with distinct groove above, fades out ventrally. Anteriorly, varix sweeps strongly around slightly produced siphonal canal, merges with first columellar plication. Four plications fill approximately 39% of aperture, all moderately excavated, first least so. First weakest, moderately deep, narrow, swelling on posterior side medially; second with wide flat lump, kinked downwards as it emerges, long thin finger merges distally with anterior callus; third with wide lump, very short finger extending from bottom, pointing upwards slightly distally; fourth weakest with small raised lump distally. Weak parietal ridge commences at fourth plication, extends posteriorly. Aperture moderately and uniformly wide. Surfaces of all callus deposits textured with minute pustules.

Distribution. Only known from the type locality and adjoining north west coastal area of Tobago.

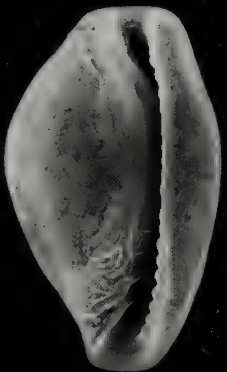
Remarks. *Granulina tobagoensis* n. sp. was found to be very common in the area along the north west coast of Tobago. It appears to be related to *G. calla* n. sp. and *G. volcana* n. sp., but is closest to *G. volcana* with which it is compared. The posterior half of the parietal wall of *G. tobagoensis.* is considerably more convex, the posterior canal is wider and slightly flared. The plications are weaker, the second is longer, thinner, and consistently extends further over the anterior callus. The external varix is stronger and the dorsal edge stronger. These are small but consistent differences.

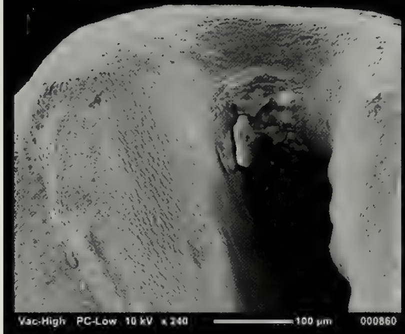
One specimen was collected with a live animal which died before imaging (Paratype 4, TMC). The largest *Granulina* so far recorded from the Caribbean – 3.42 mm – belongs to *G. tobagoensis* (Paratype 5, TMC).

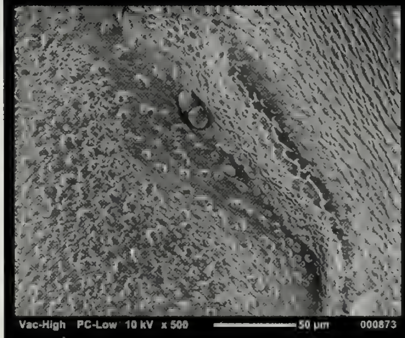
Etymology. The name is taken from the type locality.

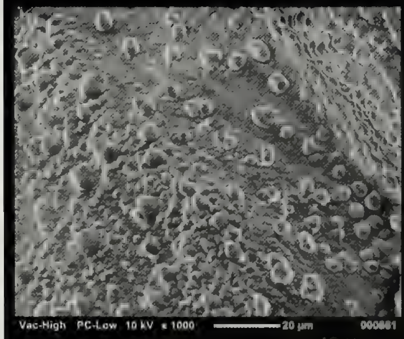
Figures 109-120

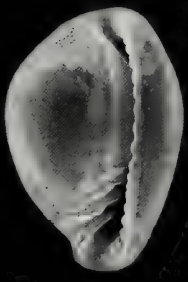
109-120. S.E.M. images of shell surface texture.
109-112. *Granulina Colonensis* n. sp. Holotype. 1.98 x 1.31 mm, W:L 66%.
113-116. *Granulina waltergomezi* n. sp. Paratype 2. 1.43 x 1.08 mm, W:L 75%.
117-120. *Granulina darienensis* n. sp. Holotype. 2.14 x 1.39 mm, W:L 65%.

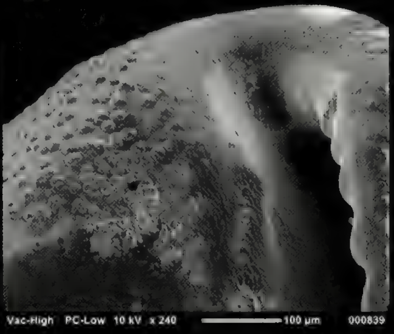

109

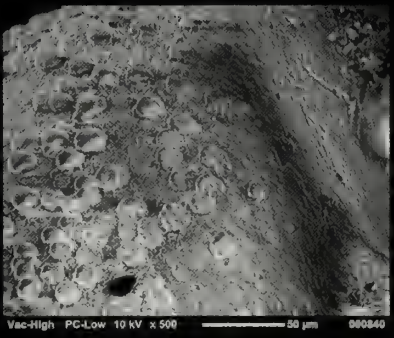

Vac-High PC-Low 10 kV x 240
100 µm
000860
110

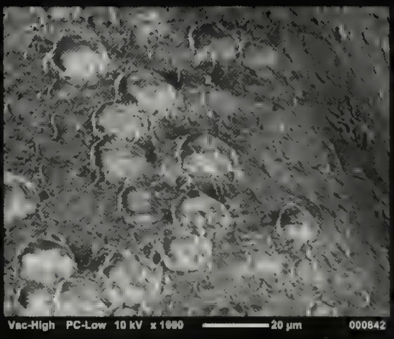

Vac-High PC-Low 10 kV x 500
50 µm
000873
111

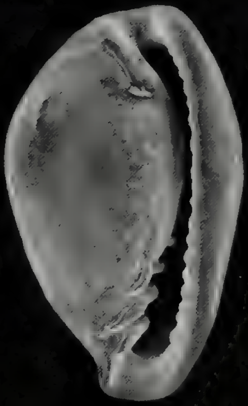

Vac-High PC-Low 10 kV x 1000
20 µm
000861
112

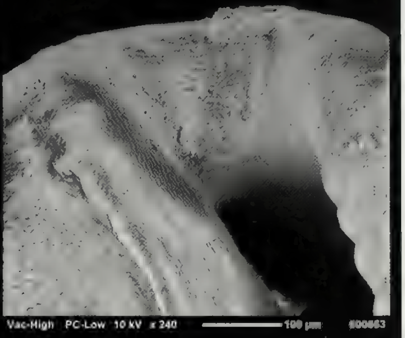

113

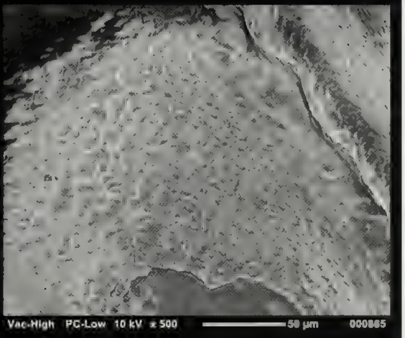

Vac-High PC-Low 10 kV x 240
100 µm
000839
114

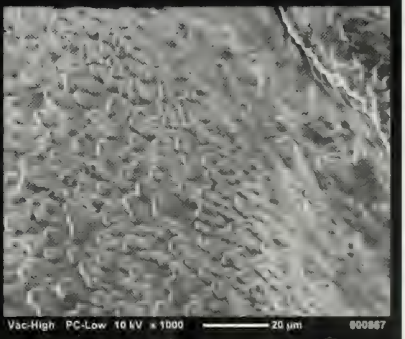

Vac-High PC-Low 10 kV x 500
50 µm
000840
115


Vac-High PC-Low 10 kV x 1000
20 µm
000842
116


117


Vac-High PC-Low 10 kV x 240
100 µm
000863
118


Vac-High PC-Low 10 kV x 500
50 µm
000865
119


Vac-High PC-Low 10 kV x 1000
20 µm
000867
120

Granulina producera n. sp.

Figs 88-90, 108

Type material. Off Piscadera Bay, Curaçao, 12°07.5'N, 68°58.5'W, 130 m.

Holotype. 2.22 x 1.30 mm, W:L 59%, MNHN 21981; paratype 1. 2.22 x 1.40 mm, W:L 63%, MNHN 21982; paratype 2. 2.23 x 1.37 mm, W:L 62%, TMC; paratype 3. 2.22 x 1.35 mm, W:L 61%, TMC.

Type locality. Off Piscadera Bay, Curaçao, 12°07.5'N, 68°58.5'W, 130 m (Map ref. 11).

Description. Shell without colour, elongate, slightly produced. Size range 2.22 x 1.30 mm to 2.23 x 1.37 mm, W:L 59-63%. Dorsum semi-transparent, somewhat striate, light callus wash, lightly textured. Lip slightly curved, mainly posterior medially, curled inwards, moderately wide, widest medially. Twenty seven denticles, strongest medially, fill inner edge. In side view, lip slightly convex. External varix wide, raised on dorsum medially, sweeps around posterior canal, flared to narrow edge. Dorsal edge of varix sweeps around posterior canal, slightly lower, as ridge, merges into parietal callus ridge. Continuing wide varix sweeps around siphonal canal, weakens, merges with first columellar plication. Anterior dorsal edge of varix continues as ridge, merges with second plication. Four weak plications fill approximately 33% of aperture, all excavated. First thin, moderately deep; second wider, tapering to point distally; third and fourth end internally. Large, flat, callus lump above second plication narrows and extends posteriorly, merges with weak parietal ridge. Aperture narrow medially, wider and slightly flared anteriorly.

Distribution. Only known from the type locality.

Remarks. *Granulina producera* n. sp. does not compare closely with any new species described herein, but is close to *G. molinai* Espinosa and Ortea, 2005, from Cuba, with which it is compared. *Granulina molinai* is represented by eight live specimens collected in Pinar, del Rio, Cuba, (Espinosa and Ortea, 2005: 38-39, Figs 306). *Granulina producera* is slightly longer at 2.22 - 2.23 mm than *G. molinai* at 1.85 - 2.0 mm, external varix is narrower medially, dorsum smooth, whereas, *G. molinai* has substantially stronger varix and is moderately striate. Most significant difference - one which clearly separates these two species - are the very unusual, elongate denticles which project outwards from the posterior extremity of the lip of *G. molinai*, whereas denticles fade out on internal edge of the slightly flared lip in *G. producera*. There appears to be a widespread group of these elongate *Granulina* inhabiting the Caribbean as the author has in his collection several other undescribed species from widely separated locations, each only represented by one or two dead shells, in poor condition,.

Etymology. The name is derived from the Latin verb *producere* meaning to elongate.

ACKNOWLEDGMENTS

The author wishes to thank Andrew Wakefield for his invaluable help during the preparation of this paper - for providing historical documents and original descriptions, for answering many questions and for his continuing encouragement; Franck Boyer for his invaluable help and guidance on many important matters, for his critical appraisal of an early draft, and for his continuing encouragement. He especially thanks Roland Houart for his support and very valuable help with technical matters relating to the writing of this article.

REFERENCES

Covert, G. A. and Coovert, H. K. 1995. Revision of the Supraspecific Classification of Marginelliform Gastropods. *The Nautilus*, 109 (2-3): 43-110.

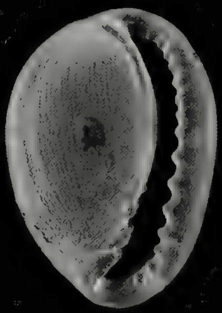
Boyer, F. and Rolán, E. 1999. *Granulina fernandesi* (Gastropoda: Volutacea), a new species from Cape Verde Islands, and some considerations on the genus *Granulina*. *Iberus,* 17 (2): 1-10.

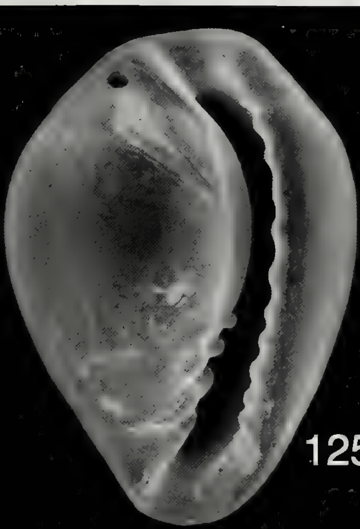
Espinosa, J. and Ortea, J. 2000. New genus and eleven new species of Cystiscidae and Marginellidae (Mollusca: Neogastropoda) from the Costa Rica Caribbean. *Avicennia*, 12/13: 95-114.

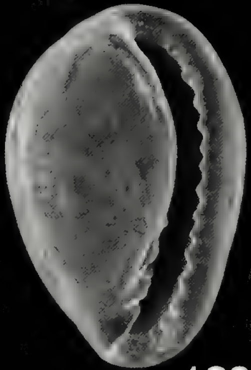
Espinosa, J. and Ortea, J. 2003. New species of Marine Molluscs (Mollusca: Gastropoda) from the National Park Guanahacabibes, Pinar del Rio, Cuba. *Avicennia,* 16: 145-146.

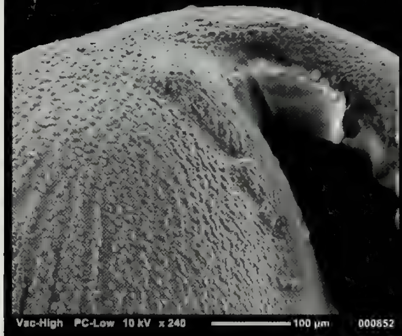
Figures 121-132

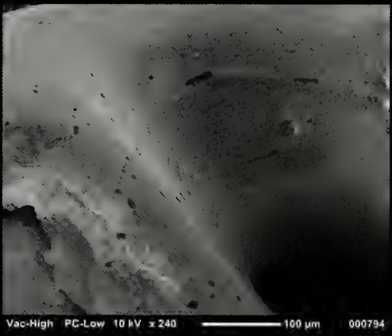
121-132. S.E.M. images of shell surface texture.
121-124. *Granulina nivalis* n. sp. Holotype. 1.62 x 1.15 mm, W:L 71%.
125-128. *Granulina tobagoensis* n. sp. Holotype. 2.79 x 2.01 mm, W:L 72%.
129-132. *Granulina ovata* n. sp. Holotype. 1.95 x 1.30 mm, W:L 67%.

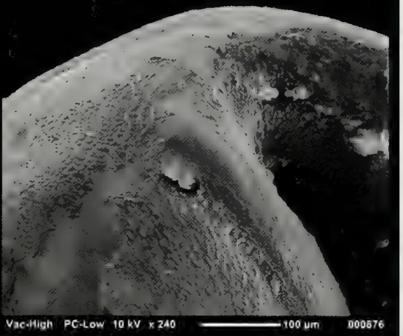

121

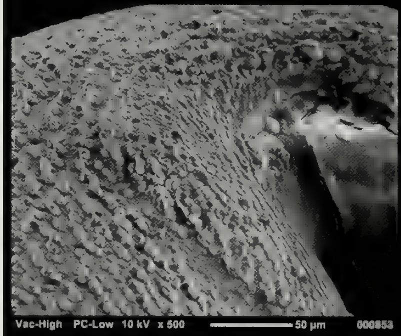

125

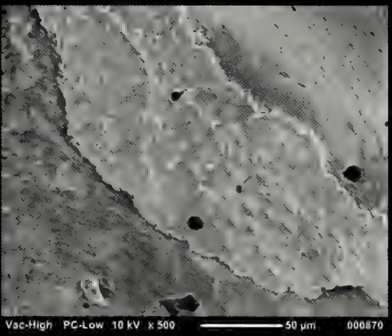

129

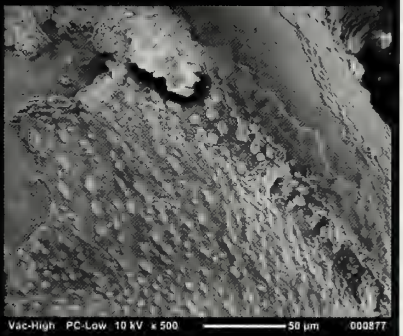

Vac-High PC-Low 10 kV x 240 100 µm 000852
122

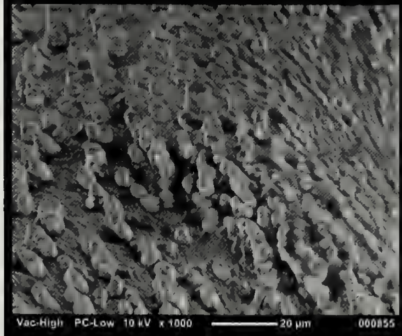

Vac-High PC-Low 10 kV x 240 100 µm 000794
126

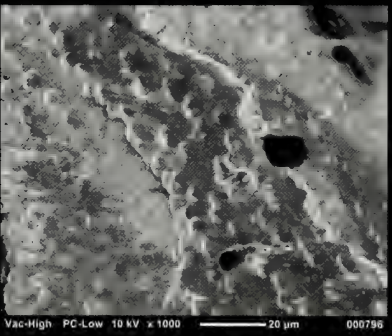

Vac-High PC-Low 10 kV x 240 100 µm 000876
130

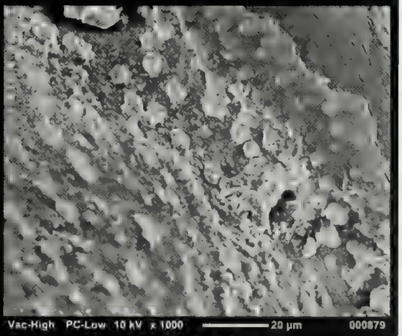

Vac-High PC-Low 10 kV x 500 50 µm 000853
123


Vac-High PC-Low 10 kV x 500 50 µm 000870
127


Vac-High PC-Low 10 kV x 500 50 µm 000877
131


Vac-High PC-Low 10 kV x 1000 20 µm 000855
124


Vac-High PC-Low 10 kV x 1000 20 µm 000796
128


Vac-High PC-Low 10 kV x 1000 20 µm 000879
132

Espinosa, J. and Ortea, J. 2005. Seven new species of the family Cystiscidae Stimpson, 1865. *Avicennia*, 18: 36-42.

De Jong, K. M. and Coomans, H. E. 1988. *Marine Gastropods from Curaçao, Aruba and Bonaire*. E. J. Brill, Leiden, 261 pp.

McCleery, T. 2008. Descriptions of sixteen new species of the genus *Gibberula* Swainson, 1840 (Gastropoda: Cystiscidae) from the Caribbean. *Novapex*, Vol. 9 (2-3): 101-108.

McCleery, T. 2009. Descriptions of four new species of the genus *Gibberula* Swainson, 1840 (Gastropoda: Cystiscidae) from the western Caribbean Sea and proposal for a new species group. *Novapex*, Vol.10 (2): 33-46.

Ramon de la Sagra, M. 1833, Physique, Politique etNaturelle de L'Ile de Cuba, Mollusques, par Alcide D'Orbigny, tome 2, P 101, Pl 20, Figs 33-35.

Tomlin, J. R. le B. 1917. A systematic list of the Marginellidae. *Proceedings of the Malacological Society of London*. 12 (5): 242-306.

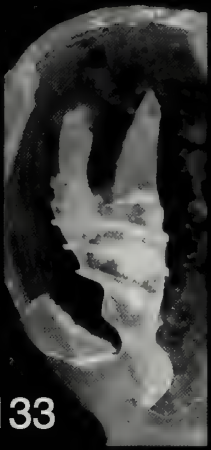
Figures 133-141

133-135. *Granulina tobagoensis* n. sp. Three dead shells from type locality, with partially resorbed internal whorls and reduced columellar plications.

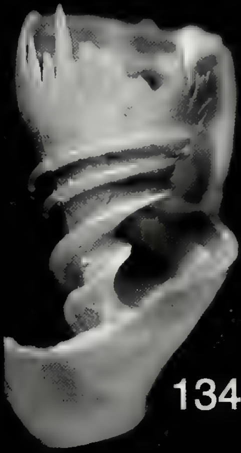
133. Adult shell, ventral view; **134.** Adult shell, dorsal view; **135.** Juvenile shell, ventral view.

136-141. *Granulina nivalis* n. sp. Adult specimen from type locality.

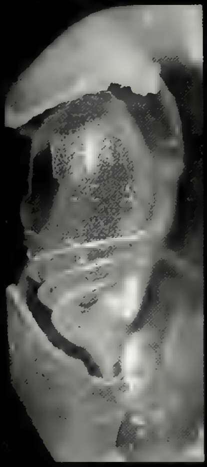
136-138. Light surface texture on internal surface of body whorl, close to apex; **139-141.** External, posterior surface of body whorl with partially removed, textured callus wash, exposing weak striations.



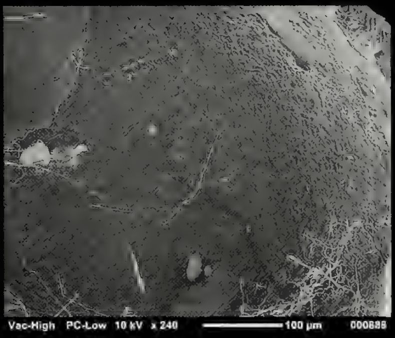
133



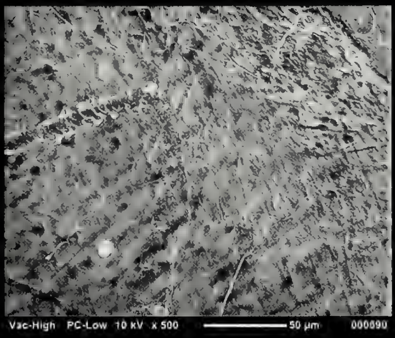
134



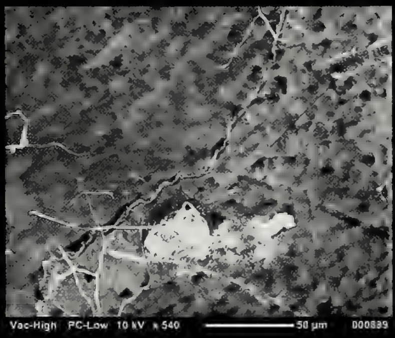
135


Vac-High PC-Low 10 kV x 240
100 µm
000886

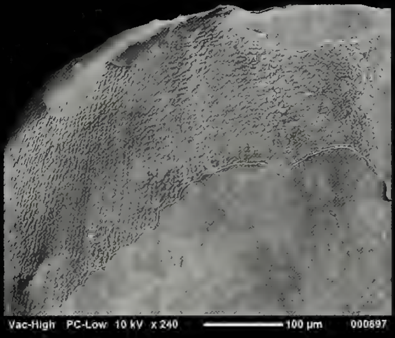
136


Vac-High PC-Low 10 kV x 500
50 µm
000890

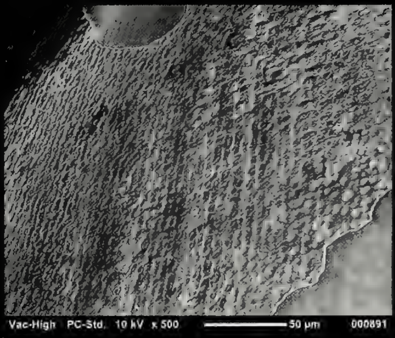
137


Vac-High PC-Low 10 kV x 540
50 µm
000889

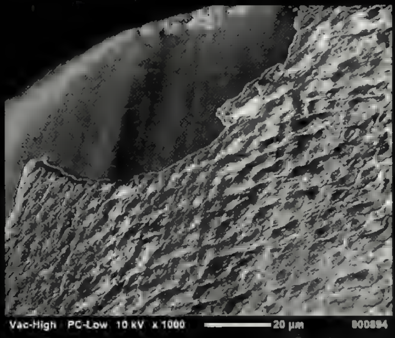
138


Vac-High PC-Low 10 kV x 240
100 µm
000897

139


Vac-High PC-Std. 10 kV x 500
50 µm
000891

140


Vac-High PC-Low 10 kV x 1000
20 µm
000894

141

Les Pickworthiidae (Mollusca: Caenogastropoda) de Polynésie française

Jean TRÖNDLÉ
Attaché au Muséum national d'Histoire naturelle,
Département Systématique et Évolution
55, rue de Buffon, 75005 Paris, France
j.trondle@orange.fr

MOTS-CLEFS. Mollusca, Caenogastropoda, Pickworthiidae, Polynésie française.

KEYWORDS. Mollusca, Caenogastropoda, Pickworthiidae, French Polynesia

RÉSUMÉ. Un inventaire des espèces de Pickworthiidae vivant en Polynésie française est présenté. Une description succincte des onze espèces actuellement connues de la région est faite, accompagnée de leur distribution par archipel.

ABSTRACT. The French Polynesian Pickworthiidae are revised. A short description of the eleven species living in the area is given with their respective geographical range.

INTRODUCTION

La famille des Pickworthiidae se compose d'une soixantaine d'espèces récentes vivant en zone tropicale, atlantique et pacifique, de petite taille (1-9 mm), peu connues des collectionneurs et n'ayant fait l'objet d'étude systématique que depuis une vingtaine d'années. D'abord uniquement étudiées d'après des coquilles vides, de récentes récoltes d'exemplaires vivants ont permis de découvrir un de leurs habitats dans des grottes sous-marines du Pacifique tropical ouest entre 20 et 55 m. (Kase & Hayami, 1992; Kase, 1998a-c). Des coquilles vides sont fréquemment draguées jusqu'à 250 m.

Sept espèces de Pickworthiidae avaient été signalées de Polynésie française avant la récente revue de la faune malacologique de Polynésie française (Tröndlé & Boutet, 2009) qui en a mentionné onze, grâce aux récoltes récentes de *Clatrosansonia jousseaumei* (Bavay, 1921), *Reynellona natalis* Iredale, 1917, *Reynellona semipellucida* Kase, 1998 et *Sansonia kirkpatricki* (Iredale, 1917). Le présent travail donne la description des 11 espèces connues à ce jour de Polynésie française.

Le seul spécimen vivant [*Astrosansonia dautzenbergi* (Bavay, 1917)] récolté en Polynésie française par l'auteur (JT) a été obtenu à Anaa (Tuamotu) par brossage sous un fragment de corail mort du platier récifal, en arrière de la crête algale. La radula a pu en être extraite par Anders Warén (NR) (Le Renard & Bouchet, 2003).

Abréviations

AM: Australian Museum, Sydney, NSW, Australie.
IRSNB: Institut royal des Sciences naturelles de Belgique.
LACM: Los Angeles County Museum of Natural History, California, Etats-Unis.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
NR: Naturhistoriska riksmuseet, Stockholm, Suède.
NSMT: National Science Museum, Tokyo, Japon.
AST: Iles Australes.
MRQ: Iles Marquises.
SCT: Iles de la Société.
TMT: Archipel des Tuamotu.
CB: Collection Christian Beslu. Tahiti - Polynésie Française.
JL: Collection Jean Letourneux. Tahiti - Polynésie Française.
JT: Collection Jean Tröndlé. La Force - France
MB: Collection Michel Boutet . Tahiti - Polynésie Française.
VW: Collection Vincent Wargnier. Tahiti - Polynésie Française

SYSTEMATIQUE

Famille **PICKWORTHIIDAE** Iredale, 1917
Genre ***Astrosansonia*** Le Renard et Bouchet, 2003

Astrosansonia dautzenbergi (Bavay, 1917)
Fig. 1

Liotia dautzenbergi Bavay, 1917: 112, 113, pl. III, figs 6-8.

Matériel type. IRSNB IG 10591, Holotype RBINS/MT/525925 - MT36 (détruits par un tube de verre acide) et 4 paratypes RBINS/MT/525926 - MT37

Localité type. *Ouvea, Wallis Insularum, in arenis* (Uvea, Iles Wallis, dans le sable).

Répartition régionale. SCT: Tahiti (Trondle, 1986: 69, JL, JT), Tetiaora (JL), Raiatea (Le Renard & Bouchet, 2003, MNHN), Tupai (JT), Motu One (JL); TMT: sans localité précise (Dautzenberg & Bouge, 1933: 407, Richard, 1985: 415), Ahe (JL), Anaa, Tikehau, Mururoa (JT), Hao (MNHN), Makemo (JL), Katiu (JL), Pinaki (JL), Rangiroa (JT, MB), Takapoto (JL).

Description. L'aspect discoïde de la coquille est celui d'une *Liotia*, genre sous lequel Bavay décrit l'espèce. La protoconque se dresse perpendiculairement à la coquille et est constituée de 2,5 tours marqués d'une carène médiane. La téléoconque de deux à trois tours aplatis est ornementée par des bourrelets axiaux dont certains se prolongent en forme d'épines à la périphérie du test. La base est sculptée de nombreux sillons axiaux. L'ombilic est large et bordé d'une rangée de nodules. L'ouverture, oblique par rapport à l'axe de la coquille, est double. Couleur sable.
Taille: D = 0,8-1,1 mm.

Remarques. Il s'agit de la plus petite espèce actuellement connue de Polynésie. Bavay signale qu'elle "habite ... en compagnie de *Liotia parvissima* Hedley". *Astrosansonia dautzenbergi* et *Lophocochlias parvissimus* sont deux espèces communément récoltées dans les sables coralliens à l'arrière du récif barrière des Îles de la Société et du récif externe des atolls des Tuamotu.

Genre ***Clatrosansonia*** Sabelli & Taviani, 2003

Clatrosansonia jousseaumei (Bavay, 1921)
Fig. 2

Mecoliotia jousseaumei Bavay, 1921: 160, pl. VI, fig. 7.

Matériel type. Non localisé! IRSNB IG 10591, 1 possible syntype, Lifou, coll. Dautzenberg, ex. coll. Goubin.

Localité type. *Lifou, Loyalty Insularum, in arenis* (Lifou, Iles Loyauté, dans le sable).

Répartition régionale. SCT: Tahiti (JL, JT, MB), Moorea (LACM); TMT: Anaa (JT), Makemo (JL), Rangiroa (JT, MB); AST: Rapa (MNHN, JT).

Description. Coquille trochiforme, blanche, à protoconque lisse, translucide et constituée de 2 tours. Les tours suivants, au nombre de six, sont parcourus par trois rides spirales, les deux premières proches l'une de l'autre, la troisième à la base des tours est parfois précédée d'une ride supplémentaire toujours plus discrète. Ces rides sont entrecoupées par de nombreuses côtes axiales formant à l'intersection de petits nodules très marqués sur le dernier tour et donnant un aspect quadrillé au test. La suture est profonde. La base est parcourue par 5 à 7 rides spirales. L'ombilic, à peine visible est le plus souvent réduit à une simple fente. L'ouverture est peu inclinée, arrondie et double. Le péristome est marqué par le prolongement de la sculpture spirale.
Taille: H = 2,0-3,0 mm.

Clatrosansonia troendlei Le Renard & Bouchet, 2003
Fig. 3

Clatrosansonia troendlei Le Renard & Bouchet, 2003: 574, fig. 3.

Matériel type. Holotype MNHN 22754.

Localité type. Afaahiti, Tahiti, Society Is, 25 m.

Répartition régionale. SCT: Tahiti (Le Renard & Bouchet, 2003, MNHN); TMT: Hao (Le Renard & Bouchet, 2003, MNHN).

Description. Très petite coquille, turbiforme, de couleur blanche. Protoconque de 2,5 tours dans l'axe de la coquille: Protoconque I lisse, protoconque II sculptée de six cordes spirales granuleuses. Les tours de la téléoconque, au nombre de trois, sont convexes et sculptés de fortes cordes spirales séparées par de profonds sillons. La sculpture axiale moins prononcée forme à l'intersection avec les cordes des nodules arrondis et détermine une réticulation de petits rectangles légèrement obliques. L'ombilic est largement ouvert et marqué de trois cordes spirales. L'ouverture est circulaire; le péristome est fortement sculpté par le prolongement des rides spirales du dernier tour.
Dimensions de l'holotype: H = 1,0 mm, D = 1,2 mm.

Remarques. Seul l'holotype, récolté mort par l'auteur (JT), et un fragment originaire de Hao, Tuamotu [leg. Le Renard (MNHN)] sont connus de Polynésie. Un fragment d'identification incertaine est également connu, provenant du Grand Récif Aboré, Nouvelle-Calédonie [leg. Bouchet & Marshall (MNHN)].

Genre ***Mareleptopoma*** Moolenbeek & Faber, 1984

Mareleptopoma iredalei (Bavay, 1921)
Fig. 4

Mecoliotia iredalei Bavay, 1921: 160, pl. VI, fig. 8.

Matériel type. Probables syntypes Tuamotou MNHN 22765, Wallis MNHN 22764.

Localité type. *Insulas Tuamotou, Wallis, Loyalty, Maurice, Réunion* (Restreint ici à l'archipel des Tuamotu).

Répartition régionale. SCT: Tahiti (JL, JT, MB), Tetiaora (JL), Mehetia (JL), Moorea (JL, JT), Huahine, Tupai (JT), Motu One (JL); TMT: Sans localité précise (Richard, 1985: 415), Anaa (JT, MB), Hao (MNHN), Makemo (JL), Rangiroa, Tikehau (JT) ; AST: Rapa (MNHN).

Description. Petite coquille à spire conique, translucide, constituée de 6 tours. La protoconque de couleur brune comporte 2,5 tours dont le premier est lisse et le suivant parcouru par 5 à 6 cordons spiraux granuleux. Deux rangées circulaires de granules arrondis ornent chaque tour, l'une sous suturale l'autre à la base du tour. La sculpture axiale est constituée de liserés reliant les granules des deux rangées. La suture est profonde. La base légèrement convexe est parcourue par 3 rides spirales, la plus externe souvent granuleuse. L'ombilic est réduit à une simple fente à peine perceptible.
Taille: H = 1,2-1,7 mm.

Remarques. L'espèce est communément récoltée morte par brossage au récif et dans les sédiments, pente externe des atolls jusqu'à 80 m.

Genre ***Microliotia*** Boettger, 1902

Microliotia alvanioides Le Renard & Bouchet, 2003
Fig. 5

Microliotia alvanioides Le Renard & Bouchet, 2003: 581, fig. 8.

Matériel type. Holotype MNHN 22755 et 8 paratypes MNHN 22756.

Localité type. Marquesas Is, off Fatu Hiva, 10°34'S, 138°42'W, 1150-1250 m, MUSORSTOM 9, stn DR1247.

Répartition régionale. MRQ: Fatu Hiva, Hiva Oa (MNHN).

Description. Petite coquille rissoiforme, de couleur blanche aux tours plats. Protoconque globuleuse de 2,25 tours lisses (I), puis sculptés (II) de 3 cordes. La téléoconque est constituée de 5,5 tours séparés par une profonde suture et est ornée d'épaisses rides axiales. Ces rides sont croisées par deux forts cordons, l'un adapical, l'autre abapical et dans l'intervalle par plusieurs cordons secondaires (4 sur le dernier tour). La base légèrement convexe est sculptée de 5 cordes spirales. L'ombilic est absent. L'ouverture est circulaire et très inclinée par rapport à l'axe de la coquille.
Dimensions de l'holotype: H = 1,75 mm, D = 1,15 mm.

Remarques. L'espèce n'est connue que des Îles Marquises.

Genre ***Reynellona*** Iredale, 1917

Reynellona marshallensis Kase, 1998

Reynellona marshallensis Kase, 1998b: 246, figs 1-3.

Matériel type. Holotype NSMT Mo 71049, 4 paratypes NSMT Mo 71050 et 5 paratypes MNHN 22751.

Localité type. Marshall Islands, Majuro Atoll, 07°07'47.7"N, 171°14'58.2", 30 m.

Répartition régionale. SCT : Raiatea (Kase, 1998c).

Description. Petite coquille blanche, rissoiforme. Protoconque de 2,5 tours d'abord lisses (I) puis finement sculptés de rides spirales (II). La téléoconque est formée de 6 tours légèrement convexes ornés de fortes rides axiales et d'un cordon sous sutural formant de petits tubercules à l'intersection avec les rides. Le dernier tour est lisse dans sa partie dorsale. La base est sculptée de 4 à 6 cordes concentriques. L'ombilic est fermé. L'ouverture, circulaire et resserrée, présente une légère protrusion du bord interne.
Taille: H = 2,15-2,30 mm.

Remarques. L'espèce est très proche de *R. natalis* (Fig. 6), mais s'en distingue par sa taille sensiblement inférieure, des tours convexes qui lui donnent un aspect plus trapu et des rides axiales plus nombreuses. L'espèce semble rare en Polynésie et n'a été signalée que de Raiatea (Kase, 1998c).

Reynellona natalis Iredale, 1917
Fig. 6

Reynellona natalis Iredale, 1917: 333, pl. XIII, fig. 7.

Matériel type. Holotype AM C.103035.

Localité type. Christmas Island, off North-East Point, 100 fathoms (183 m).

Répartition régionale. SCT: Tahiti (JL, JT); TMT: Anaa (JT), Makemo (JL), Mururoa (CB, MB).

Description. Coquille translucide, rissoiforme, de taille moyenne pour le genre. Protoconque de 2 tours lisses (I) puis marqués de fines stries spirales (II). La téléoconque est constituée de 7 tours et comporte uniquement de fortes rides axiales arrondies séparées par de larges espaces concaves. Le dernier tour est lisse dans sa partie dorsale. La base légèrement convexe est sculptée de 4 ou 5 rides spirales. L'ombilic est absent. L'ouverture est arrondie, resserrée, sensiblement décollée du dernier tour, et son bord interne est en saillie sur le péristome.
Taille: H = 2,0-3,3 mm.

Reynellona semipellucida Kase, 1998
Fig. 7

Reynellona semipellucida Kase, 1998c: 251, figs 12-14.

Matériel type. Holotype NSMT Mo 71057, 2 paratypes NSMT Mo 71058 et Mo 71059, 3 paratypes MNHN 22753.

Localité type. Philippines, ”Marigondon Cave” stn. MG(7), Mactan Is., 10°15.8’N, 123°59.2’E, 27 m.

Répartition régionale. SCT: Tahiti (JL, JT).

Description. Petite coquille, rissoiforme, translucide. Protoconque brune de 2,5 tours: Protoconque I constituée de 1,5 tours couvert de microscopiques granules, protoconque II marquée par 5 cordes granuleuses (Kase, 1998c). Téléoconque constituée de 5 tours sculptés de deux fortes cordes spirales granuleuses à l'intersection avec des rides axiales plus discrètes. Suture profonde. Dernier tour convexe. La base est parcourue par 4 larges cordes spirales dont la première possède des granules dans le prolongement de ceux du dernier tour. L'ombilic est absent. L'ouverture arrondie est peu inclinée par rapport à l'axe de la coquille et son bord interne est en saillie sur le péristome.
Taille: H = 1,4-2,5 mm.

Remarques. La protoconque des exemplaires examinés est usée. Quelques différences sont à noter dans la forme polynésienne. La sculpture est formée par deux rangées spirales de nodules séparée par un sillon, plus profond sur les derniers tours que sur les premiers, plutôt que par des rides axiales bituberculeuses. Sur la rangée abapicale les tubercules sont plus prononcés et moins allongés. L'espèce est proche de *M. iredalei* (Fig. 4) mais elle est plus grande et les tours sont convexes.

Genre ***Sansonia*** Jousseaume, 1892

Sansonia kirkpatricki (Iredale, 1917)
Fig. 8

Pickworthia kirkpatricki Iredale, 1917: 332, pl. XIII, fig. 6.

Matériel type. Holotype AM C.103037.

Localité type. Christmas Island, off North-East Point, 100 fathoms (183 m).

Répartition régionale. SCT: Tahiti (JL, MB), Raiatea (JL, JT, MB); TMT: Mururoa (JT); AST: Rapa (MNHN, JT).

Description. Coquille de forme conique, blanche, semi-transparente. Protoconque lisse de 2,5 tours. Téléoconque composée de 7 ou 8 tours au profil plat. Deux cordes granuleuses spirales constituent la sculpture des premiers tours. La corde abapicale se divise ensuite pour donner une troisième corde intermédiaire. Le dernier tour est lisse dans sa partie distale. La suture est profonde. La base est plate et parcourue par 3 cordons circulaires. Un quatrième cordon borde l'ombilic réduit à une simple fente. L'ouverture est double, au bord externe large et lisse. Le péristome est très incliné par rapport à l'axe de la coquille.
Taille: H = 4-5 mm.

Remarques. *S. kirkpatricki* est la plus grande espèce polynésienne. Sur certains exemplaires le cordon abapical peut rester double jusque sur la partie dorsale du dernier tour.

Sansonia shigemitsui Kase, 1998
Fig.9

Sansonia shigemitsui Kase, 1998a: 165, figs 7-9.

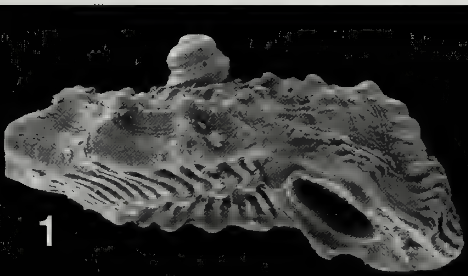
Matériel type. Holotype NSMT Mo 71991, 5 paratypes NSMT Mo 70992-70994 et 5 paratypes MNHN 22752.

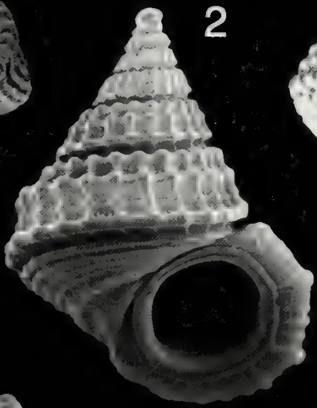
Localité type. ”Shodokutsu”, Ie Island, Okinawa, 26°42.9’N, 1237°50.1’E, 20 m.

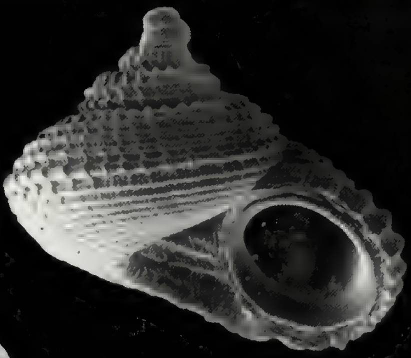
Répartition régionale. SCT: Tetiaora (JL), Raiatea (Kase, 1998a, MNHN), Tupai (JT); AST: Rimatara (JL).

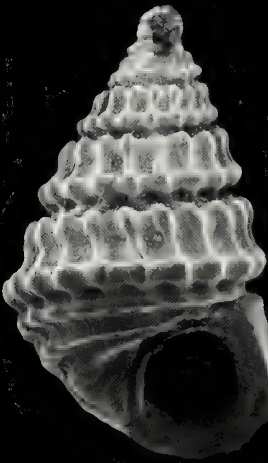
Figures 1-11

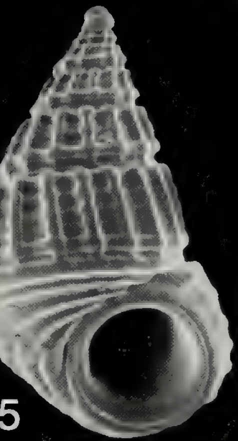
1. *Astrosansonia dautzenbergi* (Bavay, 1917): Anaa, Tuamotu, D = 1,1 mm (JT); **2.** *Clatrosansonia jousseaumei* (Bavay, 1921): Rapa, Australes, stn 8, H = 2,9 mm (MNHN); **3.** *Clatrosansonia troendlei* Le Renard & Bouchet, 2003: Tahiti, Société, H = 1,0 mm (Holotype, MNHN 22754); **4.** *Mareleptopoma iredalei* (Bavay, 1921): Rapa, Australes, stn 98, H = 1,6 mm (MNHN); **5.** *Microliotia alvanioides* Le Renard & Bouchet, 2003: Fatu Hiva, Marquises, H = 1,4 mm (Holotype, MNHN 22755); **6.** *Reynellona natalis* Iredale, 1917: Afaahiti, Tahiti, Société, H = 2,1 mm (JT); **7.** *Reynellona semipellucida* Kase, 1998: Afaahiti, Tahiti, Société, H = 2,3 mm (JT); **8.** *Sansonia kirkpatricki* (Iredale, 1917): Rapa, Australes, stn 36, H = 3,6 mm MNHN); **9.** *Sansonia shigemitsui* Kase, 1998: Tupai, Société, H = 1,8 mm (JT); **10-11.** *Sherbornia mirabilis* Iredale, 1917: Mururoa, Tuamotu, H = 2,3 mm (JT).

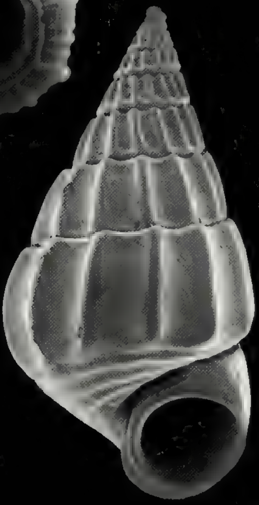

1

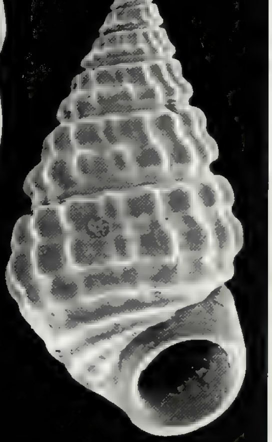

2

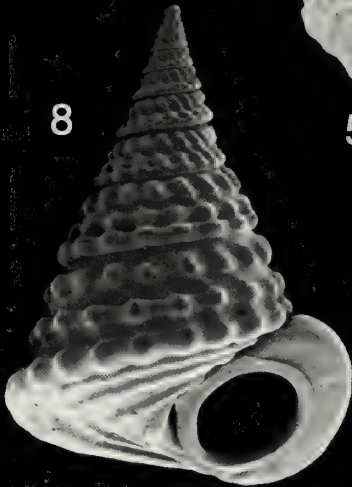

3

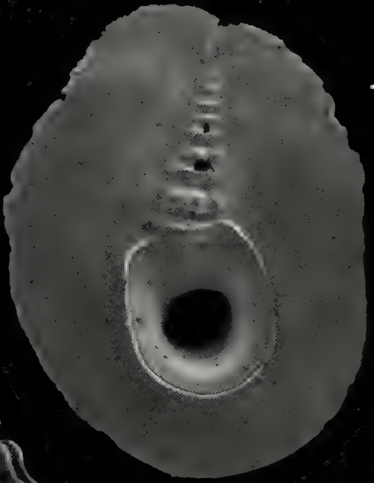

4

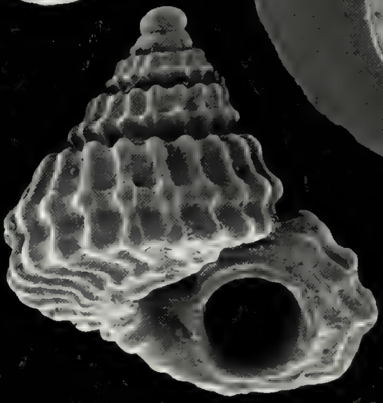

5

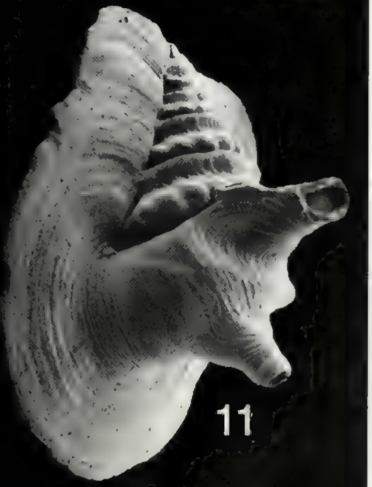

6


7


8


10


9


11

Description. Petite coquille trochiforme, blanche à protoconque bulbeuse de 1,5 tours d'abord lisse (protoconque I) puis finement striée (protoconque II). La téléoconque est constituée de 4 tours sculptés de deux cordes circulaires, noduleuses à l'intersection avec des rides axiales. Une troisième corde intermédiaire prend naissance dans la moitié distale du dernier tour. La suture est profonde. La base, au bord anguleux, est concave et parcourue de rides axiales dans le prolongement de celles du dernier tour. L'ombilic est large et profond bordé par deux rangées de nodules. L'ouverture est double, le péristome est épais et marqué de plusieurs stries de croissance dans sa partie externe.
Taille: H = 1,0-1,8

Remarques. La forme générale de la coquille est celle de *C. jousseaumei* (Fig. 2), mais cette dernière est deux fois plus grande et la sculpture des tours et de la base les différencie sans confusion possible.

Genre ***Sherbornia*** Iredale, 1917

Sherbornia mirabilis Iredale, 1917
Figs 10-11

Sherbornia mirabilis Iredale, 1917: 331, pl. XIII, figs 1-4.

Matériel type. Holotype non localisé, paratype AM C.49706

Localité type. Christmas Island, off North-East Point, 100 fathoms (183 m).

Répartition régionale. SCT: Tahiti (JL); TMT: Anaa (Cernohorsky, 1981: 200, JT), Mururoa (Cernohorsky, 1981: 200, figs 15-19, JL, JT, MB, CB, VW,), Makemo (JL).

Description. Coquille fusiforme, blanche composée de 7 tours. La protoconque est lisse sur 1,5 tours et marquée de 3 fines rides spirales sur les 1,5 tours suivants. Les tours de la téléoconque sont ornés de deux cordons spiraux, séparés par un profond sillon: un cordon adapical lisse et un cordon abapical fortement noduleux. La suture est canaliculée. Le dernier tour est lisse, anguleux et laisse apparaître deux canaux face dorsale. L'ouverture est petite approximativement dans l'axe de la coquille, s'ouvre face ventrale, et possède un large péristome autour duquel s'étend une palette marquée de stries concentriques de croissance sur son entière surface.
Taille: H = 1,8-3,0 mm

REMERCIEMENTS

Nous sommes reconnaissant à Philippe Bouchet et Jacques Le Renard pour leurs conseils et pour nous avoir permis d'accéder aux collections et aux types conservés au MNHN. Nous remercions Philippe Maestrati pour la réalisation de la planche et des photos faites à partir du MEB du Service commun de microscopie du MNHN. Nos remerciements vont également aux collectionneurs de Polynésie française, Jean Letourneux pour les informations concernant de nombreuses localités et en particulier Christian Beslu et Michel Boutet pour le prêt d'un important matériel.

BIBLIOGRAPHIE

Bavay, A. 1917. Quelques coquilles des sables littoraux de divers pays. *Journal de Conchyliologie*, 63: 91-114, pl. II, III.

Bavay, A. 1921. Coquilles des sables marins de l'Indo-Pacifique. Genres *Sansonia* Jousseaume, *Pickworthia* Iredale, *Mecoliotia* Hedley. *Journal deConchyliologie*, 66: 155-161.

Cernohorsky, W.O. 1981. Taxonomy of some Indo-Pacific Mollusca. Part 9. *Records of the Auckland Institute and Museum*, 18: 193-202.

Dautzenberg, P. & Bouge, J.L. 1933. Les mollusques testacés marins des Etablissements français d'Océanie. *Journal de Conchyliologie*, 77: 41-108, 145-326, 351-469.

Iredale, T. 1917. On some new species of marine Mollusca from Christmas Island, Indian Ocean. *Proceedings of the Malacological Society of London*, 12: 331-334.

Kase, T. 1998a. The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: Four new species of *Sansonia*. *Venus*, 57(3): 161-172.

Kase, T. 1998b. The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: Seven new species of *Microliotia*. *Venus*, 57(3): 173-190.

Kase, T. 1998c. The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: Five new species of *Reynellona*. *Venus*, 57(4): 245-257.

Kase, T. & Hayami, I. 1992. Unique submarine cave fauna: composition, origin and adaptation. *Journal of Molluscan Studies*, 58(4): 446-449.

Le Renard, J. & Bouchet P. 2003. New species and genera of the family Pickworthiidae (Mollusca, Caenogastropoda). *Zoosystema*, 25(4): 569-591.

Richard, G. 1985. Fauna and Flora, a first compendium of French Polynesian sea-dwellers. *In*: B. Delessale, R. Galzin & B. Salvat (éds). 5th International Coral Reef Congress, Tahiti, 27 May-1 June 1985. Vol.1: "French Polynesian Coral Reefs": 379-520.

Tröndlé, J. 1986. Premières données en écologie et faunistique sur la microfaune malacologique de Tahiti. *Haliotis*, 15: 61-72.

Tröndlé, J. & Boutet, M. 2009. Inventory of marine molluscs of French Polynesia. *Atoll Research Bulletin*, 570: 87 p.

Description of *Epitonium yangi* n. sp. (Gastropoda: Epitoniidae) from the East China Sea

Leonard G. BROWN
5 Vumbaco Drive, Wallingford, CT 06492, USA
Epmanshell@AOL.com

KEYWORDS. Gastropoda, Epitoniidae, *Epitonium*, new species, East China Sea.

ABSTRACT. *Epitonium yangi*, a new species from the East China Sea, is described and compared with similar species from the Indo-Pacific: *Epitonium spyridion* Kilburn, 1985, *E. vestale* (Hinds, 1844), *E. innesi* (Jousseaume, 1912), *E. coutieri* (Jousseaume, 1912) and *E. goldsmithi* (DuShane, 1988).

INTRODUCTION

The East China Sea is a section of the Pacific Ocean bordered on the north by the Yellow Sea, on the east by the Ryukyu and Kyushu Islands, on the south by Taiwan and on the west by China.

A review of the literature on the Epitoniidae, my area of research interest, did not provide much information on epitoniids found in the East China Sea. Given the apparent lack of information on the Epitoniidae occurring in this part of the Pacific, in 2006, when dealers began selling shells that were trawled in the East China Sea, I began to systematically acquire the specimens they were offering for sale in order to compile a report on the members of that family occurring in the region. See Brown (2009: 21) for this report.

In the course of collecting that series of specimens and preparation of the report, a species was recognized as new to science. This new species is described herein.

Abbreviations

ANSP: Academy of Natural Sciences, Philadelphia.
MNHN: Museum national d'Histoire naturelle, Paris
dd: specimen(s) collected dead.

SYSTEMATICS

Family **EPITONIIDAE** S. S. Berry, 1910
Genus ***Epitonium*** Röding, 1798
Type species: *Turbo scalaris* Linnaeus, 1758 (Subsequent designation by Suter, 1913)

Epitonium yangi n. sp.

Figs. 1- 3

Type material. Holotype ANSP 423044, length 16.1 mm, width 8.4 mm. Paratypes: ANSP 423045, length 11.2 mm, width 5.9 mm, ANSP 423046, length 16.7 mm, width 8.7 mm; ANSP 423047, length 15.3 mm, width 7.9 mm.

Type locality. East China Sea, in 150 m.

Material Examined. East China Sea, trawled, 150 m, sand bottom, 1dd (holotype). East China Sea, trawled, 180 m, 1dd (paratype ANSP 423045). East China Sea, trawled, 1dd (paratype- ANSP 423046). East China Sea, trawled, 180 m, 1dd (paratype ANSP 423047). East China Sea, Zhejiang Province, China, trawled, up to 130 m, 1dd, in the author's collection. East China Sea, trawled, 150 m, 1 dd, in the author's collection.

Distribution. East China Sea, 130-180 m (shell only).

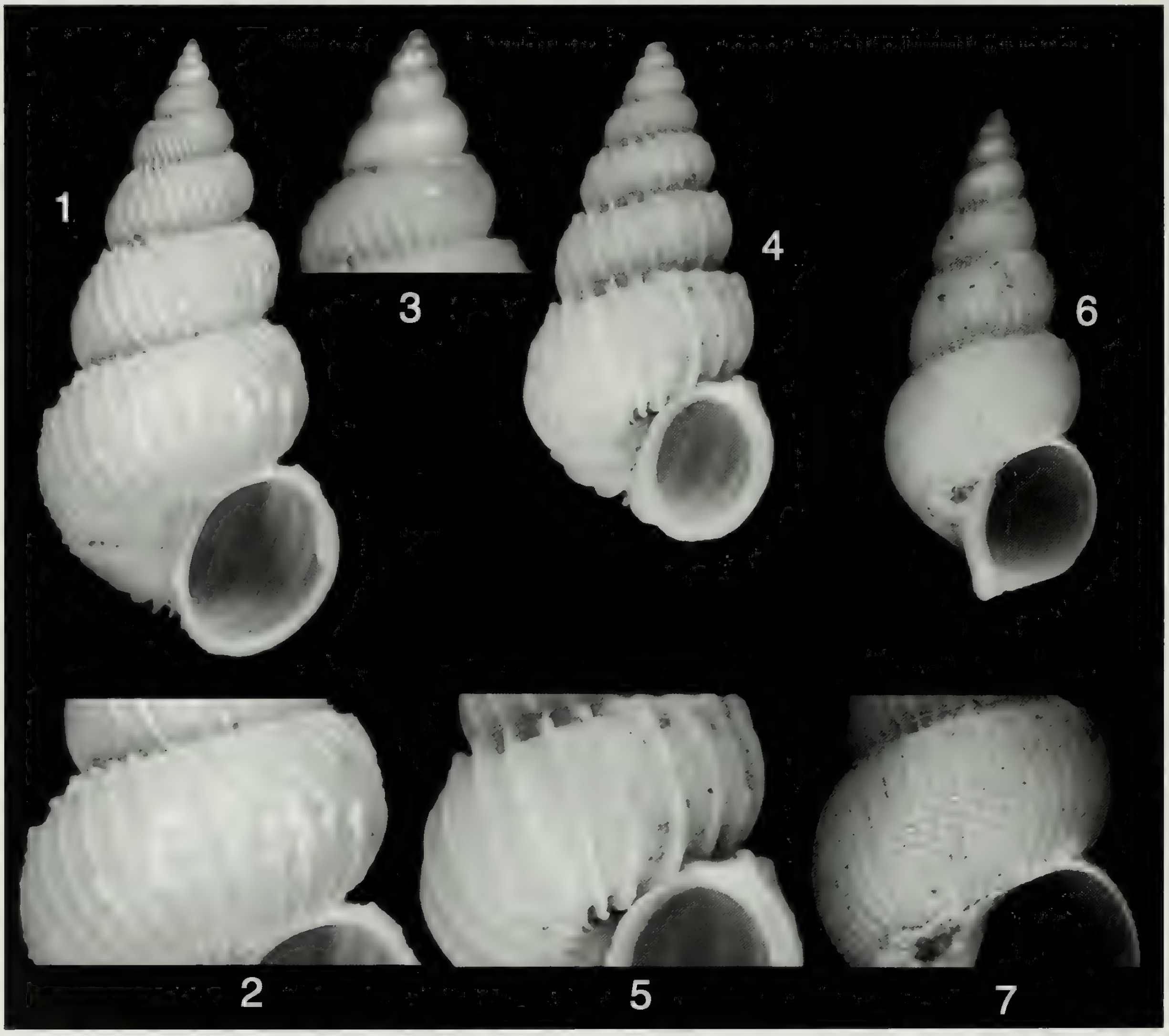
Description. Shell up to 16.7 mm in length, pyramidal (width/length ratio 0.52 to 0.56); 3-3.5 conical, glassy protoconch whorls with dark line below suture; teleoconch of up to 7 convex whorls; sutures deep, narrowly fenestrate. Axial costae thin, low, erect, prosocline, discontinuous, with weak coronation close to suture; 17 to 25 costae on last whorl. Intervals between costae with thin, low, tabulate spiral lirae, narrower than interspaces on abapical whorls. Number of spiral lirae on penultimate whorl ranging from 25 on the holotype (16.1 mm in length), to 20 on first paratype (11.2 mm in length) and 38 on second paratype (16.7 mm in length). On abapical whorls, microscopic axial and spiral threads present in spaces between stronger spiral striae. Umbilicus wide, open; aperture ovate, with a thin peristome; auricle slightly expanded; shell white; operculum unknown.

Remarks. Kilburn (1985: 324) used the subgenus *Asperiscala* for spirally sculptured species with peaked costae and partial uncoiling that are bulbous and have a widely open umbilicus. *Epitonium yangi* is one of three species from the East China that fit these criteria. The other two species are *E. spyridion* Kilburn, 1985 and *E. vestale* (Hinds, 1844).

Epitonium yangi can be separated from *E. spyridion* (Figs. 4-5) by the more numerous, thinner costae that are only slightly reflected and that have peaks set closer to the sutures. In addition, the costae on *E. yangi* are discontinuous on the abapical whorls, whereas on *E. spyridion* the costae are continuous from whorl to whorl. Moreover, in the case of *E. spyridion*, the intercostal spaces are noticeably cancellate due to the combination of axial and spiral lines. This cancellate sculpture is easily seen in Kilburn's photograph of the paratype 1985: 323, fig.147). *Epitonium yangi* has an intercostal sculpture consisting of numerous, fine spiral lines with microscopic axial and spiral threads in the spaces between the spiral lines, resulting in a much finer, less cancellate sculpture compared to the strongly cancellate sculpture in the intercostal spaces of *E. spyridion*. While the three examples of *E. yangi* with an intact protoconch have 3 - 3.5 whorls and a dark line below the suture, the protoconch of *E. spyridion* has 4.5 whorls, and the dark line is not visible on the protoconch of Kilburn's figured specimens, nor is it mentioned in the description.

Epitonium vestale (Hinds, 1844) (Figs. 6-7), another species with which *E. yangi* can be confused, also occurs in the East China Sea. It can be distinguished from *E. yangi* by being more acuminate, rather than pyramidal, by having thin, erect, rather than prosocline costae and by having strong spiral cords on the abapical whorls, instead of the more numerous, much weaker spiral cords of *E. yangi*.

Two other Indo-Pacific species with somewhat similar shell characters are *E. innesi* (Jousseaume, 1912) and *E. coutieri* (Jousseaume, 1912) from Aden and Djibouti.



Figures 1-7

1-3. *Epitonium yangi* n. sp., length 16.1 mm, width 8.4 mm, East China Sea, trawled, 150 m, sand bottom, Holotype (ANSP 423044); **4-5.** *Epitonium spyridion* Kilburn, 1985, length 10.4 mm, width 5.4 mm, East China Sea, Zhejiang Province, China, trawled up to 130 m. (Brown collection No. 930); **6-7.** *Epitonium vestale* (Hinds, 1844), length 10.7 mm, width 4.8 mm, East China Sea, trawled in about 130 to 230 m. (Brown collection No. 900).

Epitonium innesi can be differentiated from *E. yangi* by the continuous costae that have coronations set much further from the suture and give the teleoconch whorls a stepped appearance. This character is evident in the photographs of syntypes at MNHN, shown at : http://dsiphoto.mnhn.fr/malaco/TYPEMBR/epitoniidae/4281.jpg. Also see Kaicher (1981: card 3077). *Epitonium coutieri* has continuous costae similar to those of *E. innesi*, as well as less numerous intercostal spiral cords than *E. yangi*. A photograph of the syntype can be seen at : http://dsiphoto.mnhn.fr/malaco/TYPEMBR/epitoniidae/4233.jpg.
Epitonium goldsmithi (DuShane, 1988) is more acuminate than *E. yangi* and has a skewed protoconch. See DuShane (1988:268, figs. 3, 4).

Etymology. Named for Hao Yang, a shell dealer from Fujian Province, China who provided the holotype.

ACKNOWLEDGEMENTS

I want to thank Dr. Emilio Garcia, University of Louisiana at Lafayette, who examined examples of the species described herein and provided me with his comments, Amanda Lawless, ANSP, Philadelphia, PA who photographed the holotype, Patrick Sweeney, Peabody Museum of Natural History, New Haven, CT who photographed the other illustrated specimens, Lawrence Gall, Peabody Museum of Natural History, New Haven, CT who prepared the plate and Bruce Neville, Texas A & M University who provided copies of papers listed in the bibliography.

REFERENCES

Brown, L. 2009. Report on the Epitoniidae of the East China Sea. *American Conchologist* 37(2): 21-25.

DuShane, H. 1988. New Hawaiian species of Epitoniidae (Mollusca: Gastropoda). *The Veliger* 31(3-4):267-271, 7 figs.

Kaicher, S.D. 1981. *Card Catalogue of world-wide shells*. Pack # 30, Epitoniidae Part II (1981). published by the author, St. Petersburg, Florida.

Kilburn, R. N. 1985. The family Epitoniidae (Mollusca: Gastropoda) in southern Africa and Mozambique. *Annals of the Natal Museum* 27(1): 239—337.

NOTE AUX AUTEURS

Conditions Générales. L'affiliation à la Société n'est pas obligatoire pour les auteurs. La publication des articles de maximum 12 pages imprimées en double interligne est gratuite. Au-delà de 12 par numéro, chaque page sera facturée au prix de 40,00 €. Les articles de taille supérieure peuvent être scindés sur plusieurs numéros.
Les numéros hors série sont publiés irrégulièrement. Les auteurs désireux de soumettre un article pour un numéro hors série (40 pages imprimées ou plus) sont priés de contacter auparavant la Société Belge de Malacologie à l'adresse ci-dessous.
Les articles décrivant de nouvelles espèces (sous-espèces) ne seront acceptés que si le matériel type primaire est déposé dans un Musée ou une Institution scientifique publique.
Les auteurs devront suivre strictement les règles du *Code de Nomenclature Zoologique* (quatrième édition).
Manuscrits. Les manuscrits seront rédigés en français ou en anglais. Ils doivent être dactylographiés, justifiés à gauche, avec double interligne, sur une seule face de papier A4 et sur une colonne. Les marges doivent être de 25 mm minimum. La séquence des sections respectera l'ordre suivant : titre, nom de(s) auteur(s), adresse(s) de(s) auteur(s), mots-clés et résumé en anglais (et éventuellement en français). Les noms de genre et des (sous) espèces seront en caractères *italiques*. Les références dans le texte auront la forme: Keen & Campbell (1964) ou (Keen & Campbell, 1964). **Consultez un numéro récent de Novapex pour l'organisation du texte.**
La liste des références, en ordre alphabétique, respectera la forme suivante (les titres des publications ne devraient pas être abrégés):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.
Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells.* William Collins Publishers Ltd: xiv + 500 pp.
Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
Source Internet:
Auteur(s) 2007. Titre du site web ou de la base de données, nom de l'éditeur et localité (si indiquée), nombre de pages, adresse: http://www.... (date d'accès).

Illustrations. Les photographies doivent être de bonne qualité (couleur ou noir/blanc), imprimées sur papier brillant et montées sur un support adéquat dans le format final souhaité (max. 16 X 21 cm). Des photographies en couleur peuvent être soumises pour une reproduction en noir et blanc. Les illustrations peuvent également être fournies sur un support informatique (CD-ROM, ZIP) en format PSD (Photoshop) BMP, JPG ou TIFF avec mention du programme utilisé. Elle doivent être montées et ne peuvent contenir aucun texte, sauf la numérotation. Une version imprimée des planches doit être impérativement jointe au manuscrit.
Si plus d'une figure apparaît sur une planche ou/et dans le texte, TOUTES les figures doivent être numérotées consécutivement (Fig. 1, 2, 3...) ET PAS Fig 1A, 1B, 1C, NI planche 1, Fig. 1...
L'inclusion de planches couleurs est soumise à l'approbation du conseil d'administration qui prendra la décision finale. Les auteurs désireux d'inclure une ou plusieurs planches couleurs sont priés de se renseigner quant aux possibilités offertes et aux coûts.
Traitement des manuscrits. Les manuscrits seront soumis au conseil d'administration qui distinguera les articles d'intérêt scientifique et ceux d'intérêt général. Les décisions et les commentaires seront communiqués aux auteurs, qui en tiendront compte. La version corrigée devra être renvoyée à la Société Belge de Malacologie sous forme informatisée (en Word pour Windows) accompagnée d'un tirage sur papier. Elle devra respecter strictement les instructions de mise en page qui auront été communiquées aux auteurs. Une épreuve finale sera renvoyée aux auteurs pour correction.
Tirés-à-part. En ce qui concerne les articles d'intérêt scientifique, 30 exemplaires sont gratuits, jusqu'à concurrence de 240 pages maximum, si au moins un des auteurs est membre de la Société. Les exemplaires supplémentaires (min. 30 exemplaires) seront facturés au prix coûtant.
Pour les non membres, les tirés-à-part sont à charge des auteurs, au prix coûtant (minimum 30 exemplaires). Les frais de port sont toujours à charge des auteurs.

Les manuscrits et toute correspondance seront adressés à:
Société Belge de Malacologie, M. C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye, Belgique
ou par e-mail: vilvens.claude@skynet.be

NOTE TO AUTHORS

General conditions. Membership is not mandatory for authors. Publication of papers with a maximum of 12 double spaced printed pages is free of charge. Beyond 12, every page will be invoiced at the price of 40,00 €. Larger papers may be splitted on several issues.
Supplements are published irregularly. Authors wishing to submit papers for supplements (40 printed pages or more) are asked to contact the board previously at the address mentioned below.
Papers describing new species (subspecies) will be accepted only if the primary types are deposited in a recognized public Museum or scientific Institution.
The paper will be in accordance with the rules of the *International Code of Zoological Nomenclature* (Fourth edition)
Manuscripts. Manuscripts will be in English or in French. They must be typed on one column, ragged right (left-justified), double-spaced throughout, on one side only of A4. Margins must be at least 25 mm. The sequence of sections will respect the following order: title, name of author(s), address(es) of author(s), keywords and summary in English. Generic and (sub)specific names have to be typed in *italics*. References in the text should be given as follows: Keen & Campbell (1964) or (Keen & Campbell, 1964). **Refer to a recent issue of Novapex for the lay out.**
References, in alphabetic order, should be given in the following form (titles of journals should not be abbreviated):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.
Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells.* William Collins Publishers Ltd: xiv + 500 pp.
Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
Internet resources.
Author(s) 2007. Title of the website or database, publisher name and locatiuon (if indicated), number of pages, address: http://www.... (date of access).

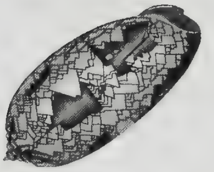
Illustrations. Photographs must be of a high quality (colour or black/white), printed on glossy paper in a final version (max. 16 X 21 cm), adequatly mounted. Colour work can be submitted for black & white production. The illustrations may be submitted as digital files (CD-ROM, ZIP) in BMP, JPG or TIFF format, with mention of the program. They must be adequately mounted with not any other text than the numbering. A printed version of the plates must be imperatively sent together with the manuscript.
If more than one figure is included in a plate or/and in the text, ALL figures must be consecutively numbered (Fig. 1, 2, 3...) NOT Fig 1A, 1B, 1C, NOR plate 1, Fig. 1...
Inclusion of colour plates has to be approved by the board who will take the final decision. Authors who want to include colour plates are invited to ask for possibilities and charges.
Processing of manuscripts. Manuscripts will be submitted to the board who will distinguish between the articles of scientific interest, and those of general aim. The comments will be communicated to authors, who will consider them. A diskette containing the corrected version should be sent back to the Belgian Malacological Society (in Word for Windows support) together with a printed copy. It should strictly follow the style instructions which will be communicated to the author(s).
Reprints. With regard to papers of scientific interest, 30 reprints are free of charge, representing a maximum of 240 pages, if at least one author is member of the Society. Additional copies (at least 30) will be invoiced at cost.
For non-members, the reprints (min. order 30 copies) will be billed to the author(s). Mailing costs are always to be paid by authors.

Manuscripts and any mail are to be sent to:
Société Belge de Malacologie, Mr. C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye, Belgium
or by e-mail: vilvens.claude@skynet.be

R. Houart, C. Vilvens, E. Meuleman & M. Alexandre	L'Assemblée Générale de la Société Belge de Malacologie du 27 février 2010	53
E.Meuleman & C. Vilvens	L'écho des réunions :	
	- Claude Vilvens : Les Solariellidae : panorama général et perspectives	61
	- Etienne Meuleman : Les espèces invasives	62
C. Delongueville & R. Scaillet	Note : A la recherche de *Rapana venosa* (Valenciennes, 1846) en baie de Quiberon	63
M. Ghesquiere	La Bourse de Faches-Thumesnil les 9 et 10 octobre 2010	63
R.Houart	Quelques nouvelles publications	64
E. Meuleman	Nous avons reçu	65
C. Delongueville & R. Scaillet	Les marées de 2010	77
C. Vilvens & E. Meuleman	**Supplément détachable du projet Cepaea** : *Cepaea nemoralis* (Linnaeus, 1758) en 4 planches couleurs	

VIE DE LA SOCIETE

LIFE OF THE SOCIETY



Prochaines activités de la SBM

Claude VILVENS

Lieu de réunion : **Nouveau local ! A partir de 14h**.

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

SAMEDI 11 SEPTEMBRE 2010

Reprise de contact / Tout le monde : Le Bernard l'Ermite

Après les vacances, beaucoup d'entre nous aurons encore dans la tête des images de mers, de plages, de rochers où ils auront, sans doute, cherché des coquilles. Et ils auront aussi trouvé des traces de "squatters de coquilles" : les Bernard l'Ermite. Mais, en fait, que savons de ces étranges animaux ? Nous ferons la synthèse de ce que nous en savons avec ce que chacun aura apporté sur ce sujet, … y compris des coquilles encore occupées ;-)

***

SAMEDI 25 SEPTEMBRE 2010

Tout le monde : Les excursions d'automne de la SBM

Cette fois, l'excursion prendra une forme particulière puisque

la SBM organise avec la Région Wallonne

La journée du Gastéropode

Il s'agit d'une activité nature destinée au grand public – le but est clairement de **promouvoir l'intérêt pour le monde des mollusques**. Elle consistera en une ballade/prospection malacologique dirigée par un membre de la SBM, de 9h30 à 12h30, simultanément en 5 lieux différents :

région visée	lieu	point de rendez-vous	guide(s)	groupement associé
Liège	thier de Caster (Petit-Lanaye)	écluse de Petit-Lanaye	Claude Vilvens (SBM)	Natagora Vesdre-Amblève
Rochefort - Luxembourg	Han-sur-Lesse	église de Han-sur-Lesse	Bruno Marée (SBM)	Naturalistes de Haute Lesse
Mons - Hainaut	environs de Mons	place de Ciply	Etienne Meuleman (SBM)	-
Dinant - Namur	Yvoir - Waulsort	gare de Dinant	Roger Williquet (SBM)	-
Bruxelles – Brabant Wallon	Hof ter Musschen	entrée de la réserve naturelle, Woluwe-Saint-Lambert	Jean-Philippe Coppée (CEBE) et Edgar Waiengnier (SBM)	CEBE

Nous espérons pouvoir compter sur la présence du plus grand nombre possible de nos membres dans ces cinq excursions qui devraient nous permettre de rencontrer des amoureux de la nature d'horizons bien différents.

Comme d'habitude, les informations les plus récentes sont disponibles sur notre site Internet (http://users.swing.be/sw216502/) ou auprès de Claude (vilvens.claude@skynet.be ou 04/248.32.25) et Etienne Meuleman (e.meuleman@skynet.be ou 04/380.55.16). Comme d'habitude aussi, il convient de prévoir d'emporter sa bonne humeur, un guide de détermination … et sans doute aussi bottes et vêtements de pluie (en principe, il fera magnifique, mais bon ;-) …).

***

SAMEDI 23 OCTOBRE 2010

C. Delongueville & R. Scaillet : Le Svalbard

Cet archipel, situé dans la Mer de Barents à quelques 1000 km du Pôle Nord, est fait de paysages de banquise, de toundra, de glaciers et de montagnes. En voyageant dans ce désert blanc nous illustrerons la faune et la flore si particulière de ces îles lointaines et bien entendu les mollusques occuperont une place de choix dans cet exposé.

-- *PUIS :* La tradition du banquet sera aussi respectée en tant qu'événement gastronomique attendu : nous vous proposons en effet de nous retrouver au traditionnel

banquet annuel de la SBM

qui débutera à 19h (voir annonce ci-dessous).

***

Réservez déjà dans vos agendas le 20/11/2010 (exposition) et le 11/12/2010.

Banquet de la Société Belge de Malacologie

le samedi 23 octobre 2010 à 19h

au restaurant :

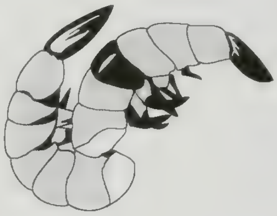
Le Rustique

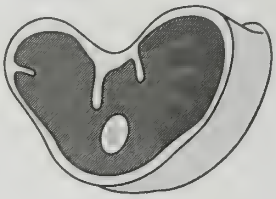
Avenue du Cimetière de Bruxelles, 155
1140 Evere

Comme d'habitude, les menus détaillés ne nous sont pas encore connus, étant donné qu'ils changent chaque mois. Cependant, le menu comprendra dans sa globalité :

- l'apéro et ½ bouteille de vin (blanc ou rouge);
- une entrée parmi 3 propositions;
- un plat principal parmi 3 propositions;
- dessert + café.

Extra à payer individuellement en supplément.





Prix : 35,00 €

Il est impératif de réserver afin que le restaurateur puisse nous réserver le meilleur accueil

Comment réserver ?

Pour le 13 octobre 2010, au plus tard, il convient de virer la somme correspondant au nombre de menus réservés au compte BBL : **310-1142433 – 53** de
Madame **Annie Langleit**, avenue Cicéron, 27/92 à 1140 – Bruxelles,
(pas de paiement à la SBM, s'il vous plaît !)

Nous nous réjouissons de vous rencontrer lors de cette joyeuse réunion !

Bonnes vacances à tous !!!

Pour les informations de dernière minute :

http://users.swing.be/sw216502/

Novapex/Société : la publication généraliste de la SBM

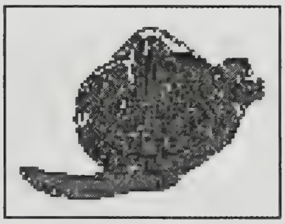
Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

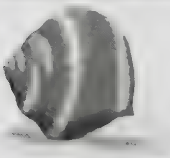
Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

Afin de faciliter le travail de la Rédaction, il est vivement (et le mot est faible ;-)) souhaité de respecter les règles suivantes pour les articles proposés :

- document MS-Word (pour PC Windows 2000 ou XP);
- police de caractères Times New Roman;
- texte de taille 10, titres de taille 12;
- interligne simple;
- toutes les marges à 2,5 cm;
- document en une seule section;
- pas de mode colonne;
- photos en version électronique JPG.

Merci pour les Scribes ;-) ! N'hésitez pas à demander une page avec en-tête pour cadrer au mieux vos travaux (vilvens.claude@skynet.be ou e.meuleman@skynet.be).



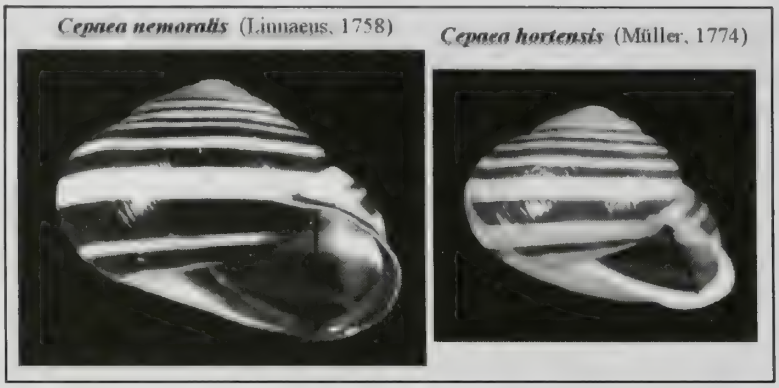


Le projet *Cepaea* de la SBM : la concrétatisation

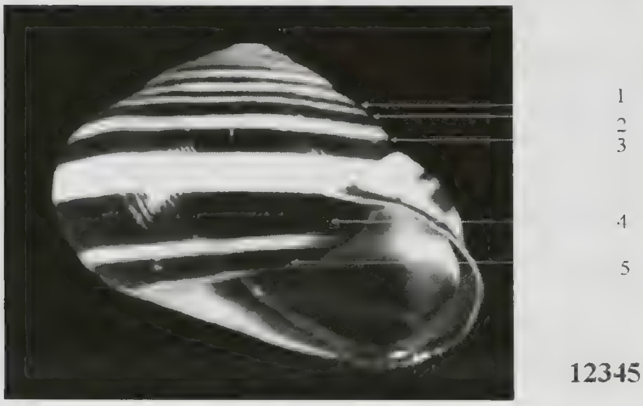
Claude VILVENS

L'une des dernières réunions de la SBM (plus précisément le 14 novembre 2009) a consisté en un "atelier" dont l'objectif était de rassembler le plus spécimens d'un escargot bien commun en Belgique (spécialement dans les jardins), j'ai nommé : ***Cepaea nemoralis*** (Linnaeus, 1758).

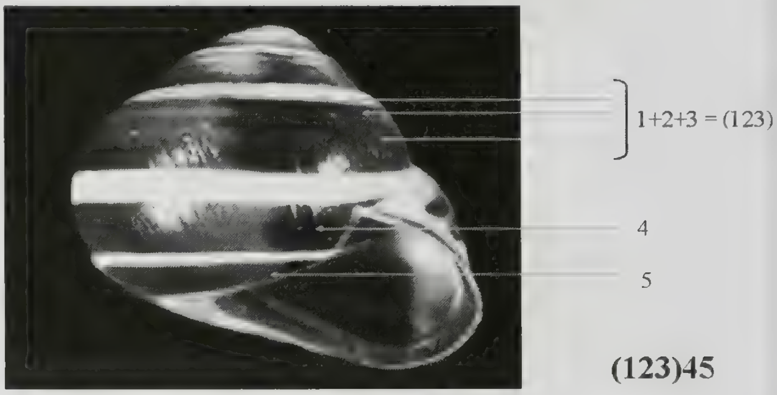
Quoi de plus répandu ? Certes, mais les variations du nombre (en principe, 5) et de l'aspect de ses bandes sont extrêmement nombreuses (potentiellement 90 formes sont possibles, bien que certaines n'aient jamais été observées de manière sûre). Des variations similaires s'observent chez l'espèce sœur ***Cepaea hortensis*** (Müller, 1774), dont elle se distingue, notamment, par une taille habituellement plus petite, une ouverture à bord blanc (mais certains spécimens de *C. nemoralis* ont aussi une ouverture à bord blanchâtre !) et surtout une ligne de plus grande distance dans l'ouverture qui est oblique (et pas verticale) :


Cepaea nemoralis (Linnaeus, 1758) ***Cepaea hortensis*** (Müller, 1774)

Le comptage des bandes s'effectue du haut vers le bas (la numéro 3 est la suturale) :

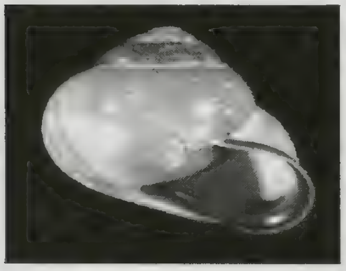


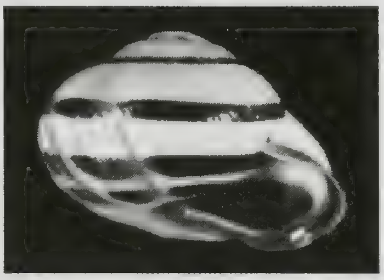
12345

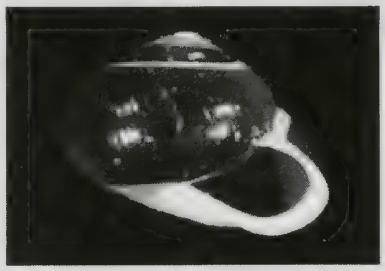


(123)45

Lorsque les chiffres sont entre parenthèses cela signifie que les bandes sont soudées entre elles. Le 0 signale une bande manquante (sa position donne le numéro de cette bande absente) :


00000


12345


(12345)

Comment dites-vous ? En couleur, ce serait plus joli ;-) ? Et bien justement, nous offrons à nos membres lecteurs

un supplément central détachable de 4 planches couleurs

rassemblant nos plus beaux spécimens rassemblés lors de notre atelier (les mesures sont bien sûr en mm).

Un **grand merci** à tous ceux qui ont contribué à la réussite de cet atelier et qui ont accepté de nous prêter quelques coquilles pour les photographies, notamment M.Alexandre, R.Houart (qui avait préparé la liste de tous les cas possibles), A.Langleit, E.Waiengnier, R.Williquet ainsi que les deux réalisateurs des planches (C.Vilvens et E. Meuleman); un remerciement tout particulier à K. Fraussen qui a apporté des spécimens atypiques ou particuliers tout à fait remarquables ☺ !

Première signalisation de *Ersilia mediterranea* (Monterosato, 1869) sur les côtes de Chypre Nord

Christiane DELONGUEVILLE
Avenue Den Doorn, 5 – B - 1180 Bruxelles - christiane.delongueville@skynet.be

Roland SCAILLET
Avenue Franz Guillaume, 63 – B - 1140 Bruxelles - scaillet.roland@skynet.be

MOTS-CLEFS Chypre Nord, Eulimidae, *Ersilia mediterranea*

KEY-WORDS North Cyprus, Eulimidae, *Ersilia mediterranea*

RÉSUMÉ

Ersilia mediterranea (Monterosato, 1869) (Eulimidae) est essentiellement répertorié dans la partie occidentale de la Méditerranée. Un spécimen de cette espèce a été isolé, en juin 2009, d'une laisse de mer prélevée au Cap Koruçam, à l'extrême ouest du territoire de Chypre Nord. Cette première signalisation dans la région complète les rares collectes effectuées dans le bassin oriental de la Méditerranée.

ABSTRACT

Ersilia mediterranea (Monterosato, 1869) (Eulimidae) is mostly found in the occidental part of the Mediterranean Sea. One specimen of this species was collected in June 2009 in shell-grit from Cape Koruçam (extreme western part of North Cyprus). This first mention in the area completes the scarce records of this species in the oriental part of the Mediterranean Sea.

INTRODUCTION

Ersilia mediterranea (Monterosato, 1869), auparavant classé dans la famille des Lacunidae, est un représentant atypique des Eulimidae (Warén 1980). Son appartenance à la famille est confirmée par son statut de parasite d'une ophiure *Ophioderma longicaudum* (Retzius, 1805) (Mifsud 1995) et par ses relations génériques avec *Ersilia stancyki* Warén, 1980, parasite d'*Ophiolepis elegans* Lütken, 1859 dans les eaux de Floride (Warén 1980). La présence d'*Ersilia mediterranea* est signalée en de nombreuses localités de la Méditerranée occidentale. Sa présence dans le bassin oriental de la Méditerranée est néanmoins attestée par des spécimens provenant de Grèce (Golfe de Saronikos - Gytheion, Péloponnèse) et d'Israël (Shiqmona) (Hoenselaar & Hoenselaar 1989).

L'aspect général de cette coquille de petite taille rappelle plus la forme d'un « *Lacuna* » que celle d'un Eulimidae. Elle se compose de 3 à 4 tours gagnant rapidement en largeur et d'une protoconque d'un tour et demi. Sa surface est entièrement sculptée de fines stries spirales. Le test est de couleur ocre à brune et le dernier tour est orné d'une bande spirale plus claire (Mifsud 1995).

RÉCOLTES PERSONNELLES

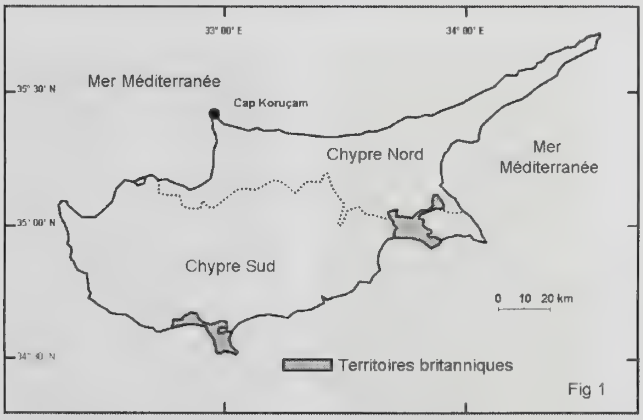


Fig 1

Le Cap Koruçam est situé à l'extrême ouest de Chypre Nord (Fig. 1). Il s'agit d'un promontoire désert, peu élevé, dominé par un mirador métallique faisant office de phare et qui se prolonge par un plateau rocheux s'enfonçant en pente douce vers un îlot situé à quelques dizaines de mètres (Fig. 2 - 3). Sur le rivage, les vagues alimentent quelques zones de sable. Celui-ci est en fait quasi entièrement composé de foraminifères et de micro-coquilles. Dans les anfractuosités des rochers, les vagues concentrent quelques laisses de mer dont l'une d'elles a fait l'objet d'un prélèvement d'un décimètre cube environ. Parmi les nombreuses espèces présentes, essentiellement des micro-gastéropodes, figurait un spécimen de *Ersilia mediterranea* (1,43 x 0,90 mm) (Fig. 4 - 5). L'hôte de cet Eulimidae, *Ophioderma longicaudum*, est très commun le long des côtes de Chypre (Demetropoulos & Hadjichristophorou 1976), ce qui rend possible la présence d'*Ersilia mediterranea* en ces lieux.

CONCLUSION

Cette première signalisation le long des côtes de Chypre Nord complète les rares mentions de la présence de cette espèce dans le bassin oriental de la Méditerranée.

RÉFÉRENCES

Demetropoulos, A. & Hadjichristophorou, M. 1976. *Echinodermata of Cyprus*. Fisheries bulletin - Ministry of Agriculture and Natural Resources, Department of Fisheries, 4:83p.

Hoenselaar, H.J. & Hoenselaar, J. 1989. On the Distribution of *Ersilia mediterranea* (Monterosato, 1869), in the Western Mediterranean Basin. *Bolletino Malacologico*, 25(5-8):255-256.

Mifsud, C. 1995. *Ersilia Mediterranea* (Monterosato, 1869) (Gastropoda, Eulimidae), An Ectoparasite of *Ophioderma longicaudum* (Retzius, 1805) (Ophiuroidae), in the Maltese Islands. *La Conchiglia*, 274:4-6.

Warén, A. 1980. Descriptions of New Taxa of Eulimidae (Mollusca, Prosobranchia), with Notes on Some Previously Described Genera. *Zoologica Scripta*, 9:283-306.

LÉGENDES

Fig. 1	Carte de Chypre
Fig. 2 - 3	Cap Koruçam - République de Chypre Nord
Fig. 4 - 5	*Ersilia mediterranea* (Monterosato, 1869): 1,43 x 0, 90 mm

Fig. 2

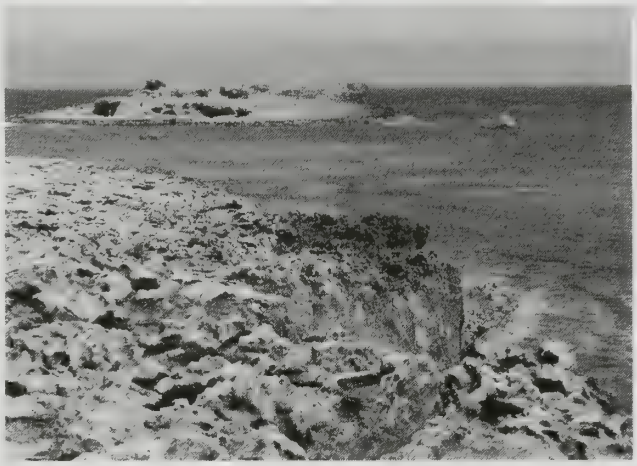


Fig. 3

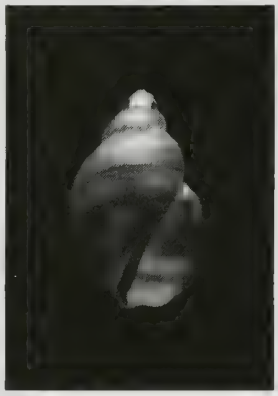


Fig. 4

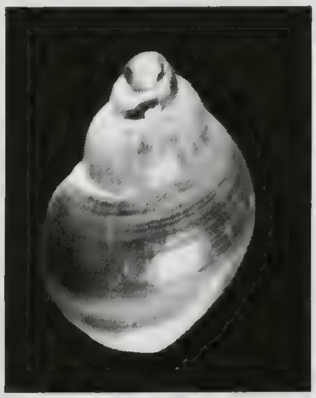


Fig. 5

Première signalisation d'*Atys macandrewii* Smith E.A., 1872 sur les côtes de Chypre Nord

Christiane DELONGUEVILLE
Avenue Den Doorn, 5 – B - 1180 Bruxelles - christiane.delongueville@skynet.be

Roland SCAILLET
Avenue Franz Guillaume, 63 – B - 1140 Bruxelles - scaillet.roland@skynet.be

MOTS-CLEFS - KEY-WORDS Chypre Nord, North Cyprus, Haminoeidae, *Atys macandrewii*

RÉSUMÉ

La présence d'*Atys macandrewii* Smith E.A., 1872, espèce amphi-atlantique appartenant à la famille des Haminoeidae a été rapportée pour la première fois en Méditerranée en 2007. En juin 2009, deux spécimens fraîchement morts d'*Atys macandrewii* ont été isolés d'une laisse de mer prélevée au Cap Koruçam, à l'extrême ouest du territoire de Chypre Nord. Cette première signalisation dans cette région de l'île complète l'aire de distribution de l'espèce en Méditerranée.

ABSTRACT

The presence of *Atys macandrewii* Smith E.A., 1872, amphiatlantic species belonging to the Haminoeidae family was reported in 2007 for the first time in the Mediterranean. In June 2009, two fresh dead specimens of *Atys macandrewii* were collected in a shell-grit from Cape Koruçam (extreme western part of North Cyprus). This first record from North Cyprus completes the distribution area of this species in the Mediterranean Sea.

INTRODUCTION

Atys macandrewii Smith E.A., 1872, est connu dans la région atlantique, des côtes de la Louisiane (USA) au Brésil et dans les archipels du Cap Vert, des Canaries, de Madère et des Açores. L'espèce a été également répertoriée dans les eaux de Malte où des spécimens vivants ont été collectés. Elle est citée en outre en Sicile (Messina) et en Israël (Tel Aviv) (Cachia & Mifsud 2007). Des spécimens de *Atys angustatus* Smith E.A., 1872, déjà connu en Mer Rouge dans le golfe de Suez, ont été récoltés en Israël (Haïfa) et en Turquie (Région de Mersin). Cette espèce a été qualifiée de nouvel envahisseur en provenance de la Mer Rouge (van Aartsen & Goud 2006). La distinction entre les deux espèces précitées est quelque peu problématique. Comme discuté dans Cachia & Mifsud 2007, le spécimen d'Haïfa figuré dans van Aartsen & Goud 2006 devrait être rapporté à *Atys macandrewii* Smith E.A., 1872 plutôt qu'à *Atys angustatus* Smith E.A., 1872 et devrait ainsi étendre la distribution de *Atys macandrewii* à la Turquie et Israël.

Re-description de l'espèce reprise de Martínez et Ortea 1998 …

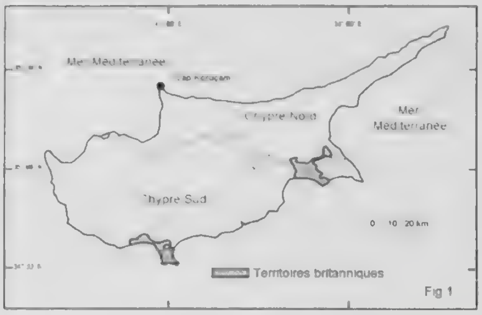
> « Coquille transparente de forme ovale allongée à ouverture étroite avec des bandes spirales opaques blanches toujours présentes et dont la densité varie d'un spécimen à l'autre. Généralement une bande large dans la partie médiane et de plus étroites vers les extrémités. Sculpture généralement faite de 7 à 10 stries spirales dans la partie postérieure et de 10 à 12 stries spirales dans la partie antérieure. La partie médiane de la coquille est quant à elle dépourvue de sculpture. »
> D'autre considérations anatomiques viennent compléter la description conchyliologique : couleurs et formes des parties molles, formule radulaire et aspect des plaques stomacales.

… et complétée par Cachia & Mifsud 2007

> « Test léger, quelque peu fragile, de forme ovale allongée, d'un blanc brillant, légèrement transparent avec des bandes blanches laiteuses. Sculpture faite de 8 - 12 stries spirales adapicales régulièrement espacées et de 11 à 12 stries spirales abapicales. La partie médiane est dépourvue de sculpture et ornée de fines et denses lignes d'accroissement. L'ouverture est étroite, allongée, plus large dans sa partie basale. La columelle est droite, légèrement épaissie, sans pli ni torsion, avec en arrière un ombilic en forme d'étroite crevasse. L'apex est perforé. La lèvre extérieure

est légère et lisse sur sa face interne. Elle s'étend un peu plus haut que la spire et rejoint le centre du vertex. Taille des spécimens 6,7 mm au maximum. »

RÉCOLTES PERSONNELLES



Le Cap Koruçam est situé à l'extrême ouest de Chypre Nord (Fig. 1). Il s'agit d'un promontoire désert, peu élevé, dominé par un mirador métallique faisant office de phare et qui se prolonge par un plateau rocheux s'enfonçant en pente douce vers un îlot situé à quelques dizaines de mètres. Sur le rivage, les vagues alimentent quelques zones de sable. Celui-ci est quasi entièrement composé de foraminifères et de micro-coquilles. Dans les anfractuosités des rochers, les vagues concentrent quelques laisses de mer dont l'une d'elles a fait l'objet d'un prélèvement d'un décimètre cube environ. Parmi les nombreuses espèces présentes, essentiellement des micro-gastéropodes, figuraient deux spécimens d'*Atys macandrewii* Smith E.A., 1872 (3,2 x 1,6 mm et 2,5 x 1,2 mm). Les coquilles étaient fraîchement mortes et dépourvues de parties molles (Fig. 2).

CONCLUSION

Cette première signalisation le long des côtes de Chypre Nord élargit l'aire de distribution d'*Atys macandrewii* Smith E.A., 1872 dans le bassin oriental de la Méditerranée.

RÉFÉRENCES

Cachia C. & Mifsud C. 2007. On the Occurrence of *Atys macandrewii* E.A. Smith, 1872 (Gastropoda: Haminoeidae) in the Mediterranean. *Iberus*; 25(1):43-48.

Martínez E. & Ortea J. 1998. Redescription of *Atys macandrewii* E.A. Smith, 1872, an Amphiatlantic Cephalaspidean. *American Malacological Bulletin*; 14(2):133-138.

van Aartsen J.J. & Goud J. 2006. Indo-Pacific Migrants into the Mediterranean - *Atys angustatus* Smith, 1872 (Gastropoda, Opistobranchia). *Basteria*; 70:29-31.

LÉGENDES :

Fig. 1. Carte de Chypre	Fig. 2 *Atys macandrewii* E.A. Smith, 1872 : 3,2 x 1.6 mm

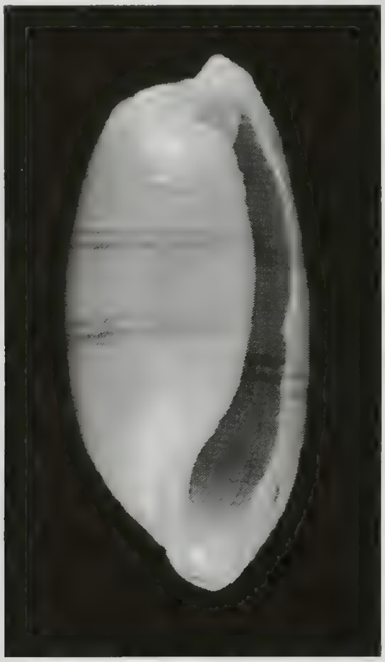
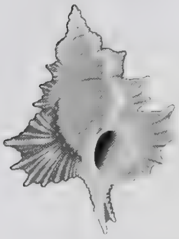


Fig. 2



L'Assemblée Générale de la Société Belge de Malacologie du 27 février 2010

Roland HOUART, Claude VILVENS, Etienne MEULEMAN et Marc ALEXANDRE

Conformément aux statuts de la Société Belge de Malacologie, nous nous sommes réunis en Assemblée Générale le samedi 27 février pour commenter ce qui a été réalisé en 2009, pour préparer nos réalisations de 2010 et pour fixer les cotisations de 2011.

Les thèmes suivant ont été discutés lors de cette assemblée:
- le **rapport moral** qui contient un compte-rendu de nos **réunions,** de nos **excursions**, de nos **publications**: **Novapex**, **Novapex/ Société.**
- un aperçu du **conseil d'administration** et des **membres** de la SBM. Nous avons aussi évoqué le **site Web** et la **bibliothèque**.
- le **rapport financier** (bilan de l'exercice 2009 et prévisions budgétaires pour 2010).

Le tout était soutenu grâce à une projection Power Point.

Après l'AG, le conseil d'administration s'est réuni pour élire en son sein "président, vice-président, trésorier et secrétaire"

Les membres de la SBM

1. RAPPORT MORAL

1.1 Les réunions

En 2009 Nous nous sommes retrouvés 8 fois au cours de réunions et 2 fois au cours d'excursions.

- Le **10 janvier 2009** nous présentions la 24me exposition de coquillages réalisée par les membres de la SBM, une manifestation devenue incontournable depuis de très nombreuses années et un succès de foule. Malheureusement en 2009 nous n'avons eu que 8 exposants, comparé aux 12 à 15 les autres années c'est très peu! Nous espérons que ce n'est pas la manifestation qui s'épuise mais que cette pauvre représentation n'est que le résultat d'un planning surchargé ou d'une absence fortuite de plusieurs membres due à d'autres activités professionnelles et/ou familiales.
L'exposition de cette année n'a pas eu lieu lors de la première réunion de l'année, puisque celle-ci fut supprimée pour des raisons de locaux inaccessibles. Cette exposition aura toutefois lieu au cours de l'année 2010.
C'est toujours un plaisir de se rencontrer lors de cette manifestation et de voir ce que les autres ont exposés tout en y apportant soi-même sa petite ou sa grande contribution. Elle nous permet de montrer ce qui fait la fierté de notre collection et par la même occasion, nous pouvons ainsi admirer d'autres réalisations, d'autres livres ou d'autres coquillages. Comme je le dis tous les ans, l'existence de ces expositions nous a permis de contempler des centaines de coquilles appartenant à des dizaines de familles différentes; des livres; des objets fabriqués à partir de coquillages ou des artefacts de coquillages. Toutes ces expos ont été fidèlement relatées et illustrées dans Arion et maintenant dans Novapex/Société (l'expo du 10 janvier 2009 a été commentée dans le Novapex/Société du 10 mars 2009, avec de multiples photos).
L'histoire de ces expos a débuté en 1986, pour fêter nos vingt ans d'existence. 24 ans après, bien que les sujets à présenter s'épuisent nous y parvenons encore chaque année ! Merci ! Un grand merci à tous ! Exposants surtout mais également visiteurs bien sûr.
Cette année nous fêterons notre 25ème exposition ! Nous comptons bien en faire un des événements de l'année ! Du moins si la salle s'y prête. Il n'est pas plus mal que cette manifestation n'ait pas eu lieu début janvier car ainsi nous aurons plus de temps pour sa préparation. Nous COMPTONS donc doublement sur vous cette année et nous vous le rappellerons certainement dans les semaines à venir. Réfléchissez déjà à un thème. Chacun est libre de présenter un thème de son choix, quelques coquilles sont éventuellement suffisantes. Basez-vous sur nos expositions antérieures (voyez les différents rapports dans Novapex/Société) et lancez-vous ! Il faut que l'expo de cette année soit une réussite pour nous tous ! Nous comptons sur vous ! Un tout grand merci d'avance !

- L'Assemblée Générale **du 7 février** nous a permis comme tous les ans de faire le point sur ce qui avait bien ou moins bien fonctionné en 2008. Cette assemblée nous a permis de faire un beau voyage en compagnie de … charnières ! Le thème était joliment intitulé "les dents de la mer" et le jeu consistait à identifier différentes familles de bivalves grâce à la représentation de leur charnière. Ce fut captivant ! Un beau cadeau en forme de calendrier 2009 vous a été offert. Comme toutes nos assemblées générales celle-ci s'est également clôturée par le verre de l'amitié.

- Le **21 mars**, Si on excepte les problèmes de connexion suite à des problèmes électriques malencontreux, qui furent heureusement rapidement résolus, la réunion fut fort intéressante. Le président de la BVC, Nathal Severijns, nous relata ses connaissances dans le domaine des Solenidae et des Pharinae européens. Le tout très agréablement et très utilement illustré. Nous avons tous apprécié cette conférence.

- Le **25 avril** Edgar Waiengnier nous présentait ce qu'il intitula son ultime conférence. Sur une très belle présentation Power Point, accompagnée d'un tableau représentant l'évolution de la terre et des espèces, Edgar nous a tenu en haleine toute l'après-midi… Allons-nous vers notre perte oui ou non… La réponse fut malheureusement assez pessimiste, mais après plusieurs mois d'angoisse nous réalisons que nous sommes encore là ! Oui, je sais, les prévisions était étalonnée sur une assez longue période et pas sur quelques mois ☺ … mais espérons que le genre humain réagira pour donner tort à cet éminent spécialiste des mollusques terrestres et des Helecidae en particulier. Puisse-t-il s'être trompé au moins une fois dans sa vie !

- Quelques semaines plus tard, le **13 juin**, David Monsecour nous emmena vers le très beau monde des *Colubraria* et des genres apparentés. En un peu plus d'une heure nous en avons appris plus sur ce groupe qu'en feuilletant de nombreuses publications et livres. Merci David !

- Le samedi **12 septembre** lors de la reprise de contact, après les deux mois de vacances, nous avions imaginé au sein du conseil qu'une bourse de coquillages pouvait avoir un effet attractif sur un grand nombre de nos membres. Nous avions invité un grand nombre de marchands et le jour venu ils étaient bien présents: une bonne douzaine, pour la plupart assez proches de nous et qui nous ont fait le plaisir de répondre présent. Je suis malheureusement moins heureux quant au nombre de participants acheteurs ! Une bonne dizaine tout au plus. Pour moi ce fut un échec et une expérience à ne pas renouveler. Pour d'autres c'est une activité à retenter. L'avenir nous dira qui avait raison.

- Le **14 novembre** nous avions notre atelier, activités maintenant bien établie dans nos activités et conférences. Il s'agissait cette fois de réunir le plus grand nombre de formes de *Cepaea nemoralis* et de *Cepaea hortensis*. Par forme nous entendions non pas seulement les formes aberrantes (senestres ou scalariformes) ni couleurs mais surtout le nombre de bandes spirales et leur positionnement sur la coquille. Ce fut une après-midi très agréable et nous avons pu totaliser un certains nombre de formes parmi les coquilles que les membres avaient apporté. Toutes ces formes sont en train de se faire tirer le portrait et seront illustrées prochainement dans Novapex/Société.

- L'année se termina le samedi **12 décembre** par une conférence de Christiane Delongueville et Roland Scaillet: les Iles Kerkennah en Tunisie.
Faut-il encore vous présenter les deux conférenciers ? Non je ne pense pas. Je ne crois pas non plus qu'il faut préciser que leur conférence rapporta un franc succès et que tous les participants furent ravis de la présentation Power Point et de la relation de voyage et de collecte ! A très bientôt Christiane et Roland, des réunions comme cela nous en redemandons !

Cette dernière phrase est d'ailleurs adressée à tous les conférenciers qui, sans exception, nous ont émerveillés et ravis en 2009 ! Revenez-nous souvent avec d'autres présentations, conférences ou relation de voyage malacologique ! Un tout grand merci pour vos prestations passées et celles à venir !

... Nous n'avons toujours pas changé d'avis : ces réunions sont une occasion de rencontre, mais elles nous offrent également l'opportunité d'échanger des idées, des nouvelles, des impressions, et de s'offrir le ou les coquillages recherchés grâce aux très sympathiques membres qui apportent des coquillages et qui garnissent nos tables !

1.2 Nos excursions.

Nous avons également exploré deux sites intéressants de la région wallonne : le 31 mai 2008 dans la région de Bomal-sur-Ourthe (relatée dans le Novapex/Société du 10 novembre 2008), tandis que le 27 septembre nous prospections la région des Honelles (relatée dans Novapex/Société du 10 mars 2009).
1) les Coteaux de la Citadelle de Liège le 23 mai 2009 : avec deux zones : le bois des Carmélites et les murs de la Citadelle et le bois Fabry depuis le fond des Tawes
2) la régionde Forêt-Trooz le 3 octobre 2009 en collaboration avec Natagora Vesdre-Amblève

Ces excursions nous ont permis de compléter très utilement l'inventaire de la faune malacologique en Wallonie et en Belgique.

1.3 Nos publications

a) Novapex

Fin 2009 nous clôturions les 10 premières années d'existence de **NOVAPEX** et de **NOVAPEX/SOCIETE**. Quatre numéros ont été publiés. Il n'y eut pas de numéro Hors Série en 2009. Comme toujours les auteurs furent nombreux et variés et les articles très intéressants. Jugez-en par vous-mêmes:

Le Volume 10 de Novapex a totalisé 177 pages ce qui nous laisse dans une moyenne supérieure comparé aux autres années.

Les numéros ont rassemblés pas moins de 19 articles des auteurs suivants. Cette année, pour information et afin de mieux cerner la diversité internationale des auteurs nous citons également leur nationalité:
David et Kevin Monsecour (Belgique), Emilio Garcia (Etats-Unis), Lopes Ricardo Simone (Brésil), Axel Alf et Kurt Kreipl (Allemagne), Frank Boyer et Jacques Pelorce (France), Tony McCleery (Grande-Bretagne), Shawn Wieddrick (Etats-Unis), Richard Salisbury et John Wolff (Etats-Unis), Emilio Rolán (Espagne) et Raúl Fernandez-Garcés (Cuba), Patrice Bail (France), Alan Limpus (Australie), Emmanuel et Evelyn Guillot de Suduiraut (Philippines), Koen Fraussen (Belgique), José Rosado (Mozambique), Carlos Afonso (Portugal)et Bernardino Monteiro (Portugal), Winfried Engl (Allemagne), Ramón Gomez (Espagne), Frank Swinnen (Belgique), Emilio Rolán (Espagne) et vos serviteurs, Roland Houart et Claude Vilvens (excusez du peu). Les familles abordées étaient variées comme d'habitude : Columbellidae, Arcidae, Turbinidae, Conidae, Cysticidae,

Muricidae, Costellariidae, Rissoidae, Volutidae, Solariellidae, Triphoridae, Calliostomatidae, Mitridae et Buccinidae se sont partagés les 177 pages, ainsi qu'un article consacré à la nouvelle signalisation de mollusques aux Iles canaries. En tout, pas moins de 38 nouvelles espèces, ont été décrites. Ces articles ont également comportés un total de 19 planches photos en couleur (10 de plus que l'an dernier) et de nombreuses planches noir et blanc.
Nous avions prévu une année faste pour 2009 au point de vue des publications, tel fut le cas. Nous essaierons de garder le même cap: toujours plus haut ! Toujours plus beau !
Où en sommes-nous après **dix ans** ! Quelles furent les résultats. Après quelques petits calculs les voici:
Sur ces **10 ans** NOVAPEX a totalisé la description de **3** nouveaux genres, **1** nouveau sous-genre, **420** nouvelles espèces, **2** nouvelles sous-espèces et **2** nouveaux noms.
Sur ces 10 ans d'existence nous avons malheureusement aussi perdu des collaborateurs et des amis et j'aimerais que nous nous souvenions de: Alphonse Thielemans, Yves Toussaint, Marie-Louise Buyle, René Masson, René Philippe, Marie-Louise Bresson, Richard Van Belle, mais aussi de Suzanna, l'épouse de Yves Finet; Antoine Lievrouw, retraité mais longtemps technicien à l'IRSNB et de nos amis et membres français Marc-Henri Girona, Jacques Vidal et Maurice Jay. Nous en oublions sans doute mais la liste est déjà beaucoup trop longue et je m'en voudrais de ne pas me souvenir de tous ces amis et membres disparus.

b) Novapex/Société

Sur un total **172 pages** (170 en 2005, 175 en 2006, 171 en 2007, 141 en 2008) dans 3 fascicules, le magazine généraliste de la SBM nous a proposé :
a) les articles originaux suivants :
- C. Delongueville & R. Scaillet : *Neopycnodonte zibrowii* Gofas, Salas & Taviani *in* Wisshak *et al.*, 2009 dans le golfe de Gascogne || Illustration de *Vitreolina philippi* (Ponzi, de Rayneval & Van den Hecke, 1854) sur *Paracentrotus lividus* (Lamarck, 1816) à Chypre Nord || *Melanella boscii* (Payraudeau, 1826) parasite de *Ocnus planci* (Brandt, 1835) à Djerba || Illustrations de *Clione limacina* (Phipps, 1774) et de *Limacina helicina* (Phipps, 1774) dans l'Arctique || Les marées de 2009
- J.-P.Coppée : Etymologie et malacologie dans deux sites naturels du nord-est de Bruxelles – Première partie
- C.Vilvens : Petit reportage à la Galerie de l'Evolution de l'Institut des Sciences Naturelles de Belgique

b) les comptes-rendus d'événements de la vie de la SBM
L'Assemblée Générale de la Société Belge de Malacologie du 7 février 2009 || L'exposition 2009 de la SBM || A propos de nos membres
c) les compte-rendus d'excursion
d) les rubriques habituelles "Prochaines activités", "Quoi de neuf ?", "Quelques nouvelles publications", "Nous avons reçu", "Morceaux choisis" et "L'écho des réunions".

Pour la première fois de son existence, Novapex/Société a proposé 4 planches couleurs (montrant les espèces observées lors de l'excurion à Forêt-Trooz).

c) Les Mollusques Terrestres Et Dulcicoles De Belgique

Pour rappel, ces publications visent à fournir des critères de détermination rigoureux et utilisables en pratique - donc sans dissection - et en n'utilisant les termes techniques que lorsque c'était vraiment nécessaire et, aussi et surtout, à faire découvrir et apprécier les mollusques par les naturalistes et le grand public en général. A l'heure actuelle, 280 exemplaires ont été vendus et il nous a donc fallu réimprimer déjà à 3 reprises.
Nous prévoyons aussi une suite : les "gastéropodes des vacances" – à suivre.

1.4 Le conseil d'administration

Le conseil d'administration se réunit généralement après chaque réunion pour discuter de points importants concernant la vie de la Société:

- Le calendrier des prochaines activités
- La trésorerie
- Novapex et Novapex/Société
- Le site internet
- La bibliothèque

Et quelques points divers tels que:

- Les tarifs postaux, la publicité, les cotisations, la liste des membres, et mille autres choses…

Comme tous les ans également, nous voudrions encore vivement rappeler que toute personne désirant faire partie de ce comité est évidemment plus que le bienvenu. Il n'y a pas de condition, sinon celle de faire partie de la Société en tant que membre ordinaire, et bien sûr, de passer par les élections.

1.5 Les membres

Nous comptions 146 membres effectifs en ordre de cotisation pour 2009 dont une douzaine d'institutions. La répartition géographique selon la Belgique, l'Europe et le reste hors d'Europe était de respectivement de 5/10, 3/10 et 2/10.
Ces chiffres reflètent une stabilité devenue habituelle depuis des années. Les décès et non-renouvellements ont été comblés largement par les nouveaux membres.
Enfin, nous comptions une quarantaine d'échanges en 2009.

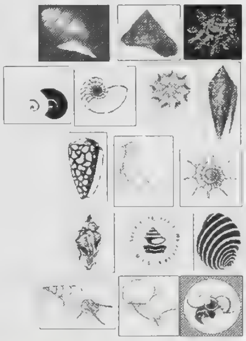
1.6 Le site web

Une **soixantaine de pages html** agrémentées de nombreuses photos :

- un fournisseur d'informations générales : présentation de la SBM, de ses contacts, présentation de la malacologie, dates des grandes marées
- un serveur d'informations pratiques : agenda des réunions, annonces et informations pratiques pour les excursions, aspects divers de la vie de la société, publicité pour les brochures des Terrestres,
- une référence didactique : table des matières de Novapex par auteurs (bientôt, idem pour Novapex/Société), dictionnaire de malacologie en français, bibliographies de malacologues célèbres, description d'expéditions maritimes célèbres ainsi que nombreux liens utiles
- notre site est cité comme référence Web dans de plus en plus d'ouvrages ! !!!

1.7 La bibliothèque

La bibliothèque se porte bien et les revues provenant du monde entier viennent enrichir son contenu. De nombreux articles et tirés-à-part sur le thème de la malacologie sont également disponibles. Quelques caisses attendent encore d'être classées …
La bibliothèque dispose également d'un stock de nos publications qui n'attendent qu'à rejoindre votre propre documentation ϑ. S'il vous manque quelques numéros d'Apex ou Novapex, n'hésitez pas à nous en parler, nous essayerons de compléter votre série !
Nous sommes loin de disposer de toutes les revues existantes, mais ce qui est encourageant, c'est que nous recevons de tant à autre des demandes provenant de l'étranger de personnes désireuses de se procurer certains articles sur des sujets précis.



Roland Houart
Claude Vilvens

2. RAPPORT FINANCIER

Bilan de l'exercice 2009

Solde créditeur au 1er janvier 2009	17966,14 €	
Cotisations	6823,00 €	
Vente publications	1062,84 €	
Vente tirés à part	125,00 €	
Vente édition Terr. Dulc. Belgique	3299,13 €	
Remboursement planches couleur et publ.	200,00 €	
Dons anonymes	263,24 €	
Intérêts fond de roulement	000,00 €	
Subsides Région Wallonne	1500,00 €	
Subsides Gouvernement Wallon	-	
Publicités	60,00 €	
Frais de publication		9463,02 €
Frais édition Terr. Dulc. Belgique		2644,40 €
Frais d'expédition		2653,18 €
Location salle		86,80 €
Location boîte postale		- €
Abonnements aux revues		241,71 €
Gestion Banque de la Poste		51,28 €
Divers		303,76 €
Modification des statuts		112,41 €
Totaux	31299,35 €	15556,56 €
Solde créditeur au 31 décembre 2009		15742,79 €
Total général	-	31299,35 €

Prévisions budgétaires pour 2010

Solde créditeur au 1er janvier 2010	15742,79 €	
Cotisations	7000,00 €	
Frais de publication		10000,00 €
Frais édition Terr. Dulc. Belgique		2500,00 €
Frais d'expédition		2800,00 €
Location salle		360,00 €
Location boîte postale		60,00 €
Abonnements aux revues		300,00 €
Gestion Banque de la Poste		60,00 €
Divers		400,00 €
Totaux	22742,79 €	16480,00 €
Solde créditeur au 31 décembre 2009		6262,79 €
Total général		22742,79 €

3. ELECTIONS

Nous n'avons malheureusement pas reçu de nouvelles demandes, mais quatre administrateurs pouvaient se représenter après être arrivés à l'expiration de leur mandat, qui rappelons-le est de 4 ans. Il s'agissait de Annie Langleit, Marc Alexandre, Edgar Waiengnier et Roland Houart.
Trois administrateurs se sont représentés car Edgar Waiengnier ne s'est pas représenté après 30 ans de bons et loyaux services au sein du conseil.
Les trois administrateurs ont été réélus à l'unanimité.

4. COTISATIONS 2010

Les cotisations ont été augmentées de cinq euros à partir du 1er janvier 2009. Nous n'avons prévu aucune augmentation pour 2011.
Cette proposition a été acceptée par un vote à main levée.

5. DIVERS

Un hommage tout spécial a été rendu à notre ami et collègue Edgar Waiengnier pour sa présence durant plus de trente ans dans le conseil d'administration de la SBM. Nous retranscrivons ici la lettre qui lui a été lue par le Président:

Cher Edgar,
Cher ami,
Cher... Petit Gris !

Il y a maintenant presque 34 ans que, en tant que secrétaire à l'époque, je t'écrivais la lettre suivante (lecture de la lettre qui lui fut adressée suite à sa demande de renseignements concernant la SBM)

Et bien sûr, en 1977 tu devenais membre de la Société Belge de Malacologie.

Tes connaissances en la matière, à savoir la malacologie, ton désir d'en savoir toujours plus, ta présence régulière à nos réunions et à nos excursions et ton implication dans nos projets... Il ne nous en fallait pas plus pour te proposer de faire partie du conseil d'administration, et... tu acceptas.

En 1980 tu rejoignis donc ce staff de doux-dingues et tu complétas le conseil, à l'époque composé de Ralph Duchamps en tant que Président, Guido Poppe et Jacques Senders, vice-présidents, ton serviteur en tant que secrétaire, M. Buyle était trésorier et son épouse, Mme Marie-Louise Buyle était bibliothécaire. Les administrateurs étaient au nombre de 5: Marie-Louise Bresson, Annie ici présente, Michel Lambiotte (ancien président), Roger Wiliquet et puis... toi ! Nous étions donc 11 à l'époque. Tu remplaças Raoul Jambe qui quitta le conseil fin 79.

Tu fus des nôtres en de maintes occasions au cours de diverses manifestations telles les expositions (Woluwe Shopping Center, Westland Shopping Center, Basilix, la journée de l'eau à Genval... et j'en oublie). Faut-il également mentionner ta participation à toutes nos expositions annuelles depuis 1986, ta participation active à la plupart des excursions... jusqu'à aller chercher des mollusques terrestres dans les arbres (mais oui ! J'en ai la preuve ici) ! Ta présence et ton aide au cours de la journée de notre quarantième anniversaire furent également très appréciés.

Tu es également LE spécialiste des mollusques terrestres et en particulier des Helicidae. A cet effet tu nous as aussi comblé avec plusieurs conférences sur ce sujet bien précis. C'est également toi qui a trouvé nos nouveaux locaux rue de la Blanchisserie, puis quelques mètres plus loin, rue du Damier, pour ensuite nous emmener durant de nombreuses années à l'Institut St. Joseph (ton école). Tu n'en restas pas là puisque c'est toujours toi qui as trouvé notre futur point d'attache.

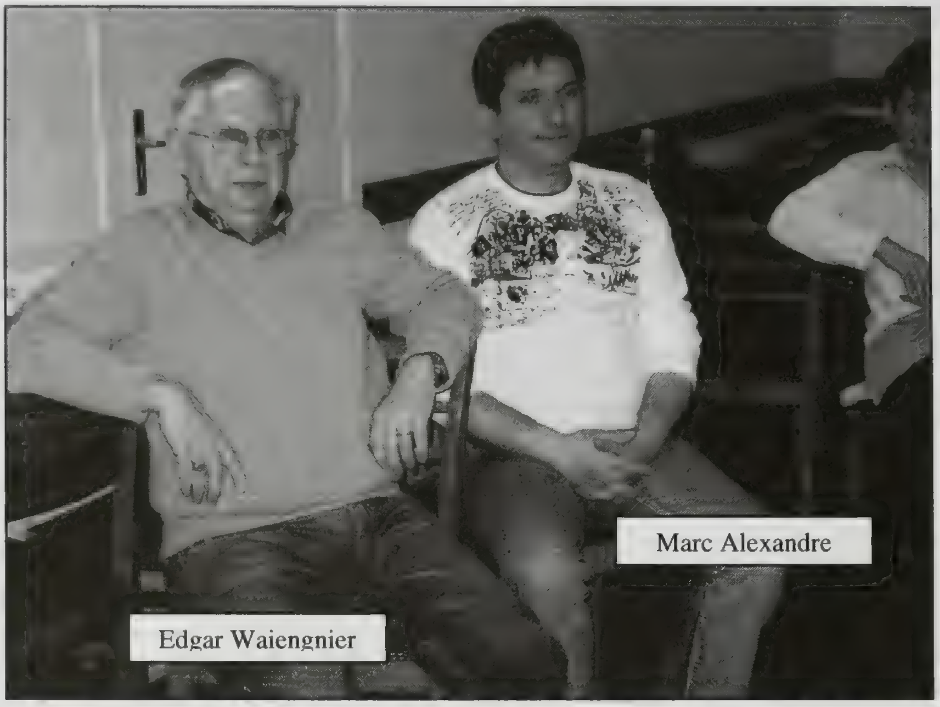
Tu as aussi mis ta collection et tes connaissances à notre disposition pour l'élaboration de nos brochures "Mollusques terrestres et dulcicoles de Belgique". Il faut également mentionner que tu occupas le poste de vice-président en 2004 pour palier à la démission de Yves Finet.

Je ne terminerai pas sans avoir touché un mot concernant ta muse... personnelle, j'ai nommé... Chantal, qui depuis que nous te connaissons a été constamment à tes côtés et nous a touché tant par sa spontanéité que par sa gentillesse, mais surtout aussi, par son amour pour toi, l'homme de sa vie! Tu as de la chance Edgar d'avoir une femme telle qu'elle ! Merci aussi à toi Chantal!

Edgar, nous allons maintenant passer en revue ces différentes étapes de ta vie au sein de la SBM (vinrent ensuite la projection de nombreuses photographies de notre ami Edgar prises au cours d'excursions, de réunions ou d'événements telles les expositions, de 1989 à 2009).

Voilà, j'espère que cela aura ravivé de bons souvenirs... à nous tous d'ailleurs.

Mais nous n'en avons pas fini avec toi Edgar, car tu penses bien qu'on ne quitte pas le comité comme ça! Nous avons pensé qu'un petit souvenir de notre part serait une petite contribution de la part de la SBM de te remercier pour ta participation active durant ces 30 ans passé au sein du conseil d'administration de la Société Belge de Malacologie!



Edgar fut aussi nommé Vice-président honoraire de la SBM. Un cadeau et un diplôme lui furent remis à cette occasion.

Comme chaque année, nous avons clôturé l'assemblée générale par un petit cadeau, ceci afin de remercier les membres présents de nous avoir accompagnés tout au long de cette année 2009. Cette année une petite verrine ornée d'un coquillage en métal argenté fut offert à chaque membre présent.
Ensuite un verre de l'amitié ensemble fut offert, accompagné de délicieuses tartes jodoignoise !

Remarque en passant : afin de rendre l'événement aussi distrayant qu'intéressant, un jeu intitulé "Upside down" a marqué toutes les étapes de l'exposé. Le principe : deux coquilles étaient présentées, l'une vue "par le haut" (vue apicale), l'autre "par le bas" (vue basale) et il s'agissait de reconnaître l'espèce. Pas si simple ;-) !

MERCI A TOUS d'être venu nombreux pour nous soutenir lors de cette Assemblée Générale !

Conformément aux statuts de la Société Belge de Malacologie, nous nous sommes réunis en Assemblée Générale le samedi 27 février pour commenter ce qui a été réalisé en 2009, pour préparer nos réalisations de 2010 et pour fixer les cotisations de 2011.

Les thèmes suivant ont été discutés lors de cette assemblée:
- le **rapport moral** qui contient un compte-rendu de nos **réunions,** de nos **excursions**, de nos **publications**: **Novapex**, **Novapex/ Société,**
- un aperçu du **conseil d'administration** et des **membres** de la SBM; nous avons aussi évoqué le **site Web** et la **bibliothèque**.
- le **rapport financier** (bilan de l'exercice 2009 et prévisions budgétaires pour 2010).

Le tout était soutenu grâce à une projection Power Point.
Après l'AG, le conseil d'administration s'est réuni pour élire en son sein "président, vice-président, trésorier et secrétaire"

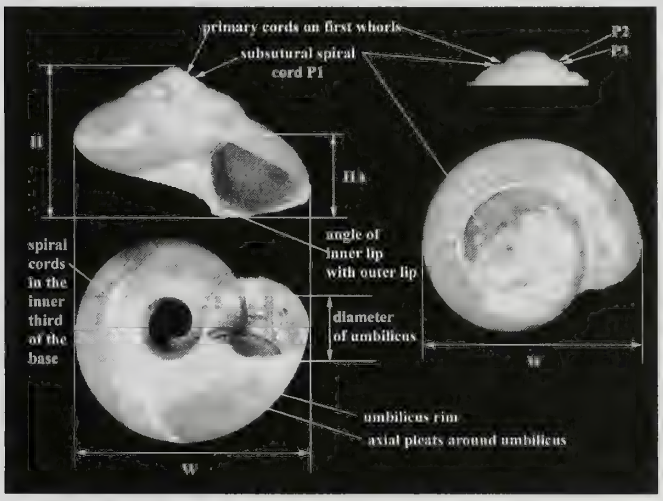
L'écho des réunions

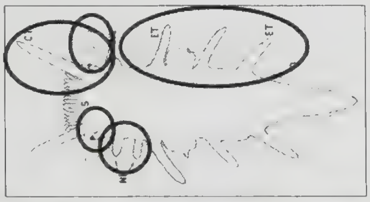
Etienne MEULEMAN & Claude VILVENS

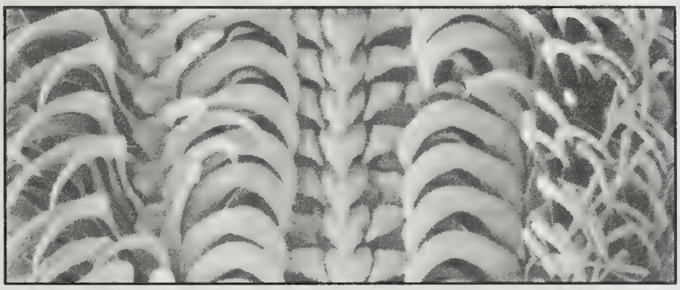
Réunion du 27 mars 2010 (EM) → **Claude Vilvens : Les Solariellidae : panorama général et perspectives**

Parmi les anciens Trochidae, dont la classification a été profondément restructurée, les espèces du genre *Solariella* et autres *Archiminolia, Microgaza, Bathymophila, Zetela*, etc constituent encore à l'heure actuelle un large sujet de recherches. L'objectif poursuivi par Claude était de brosser une vue d'ensemble de cette famille avec ses principaux genres et espèces emblématiques.

Après une présentation des caractéristiques générales des espèces appartenant à cette famille (coquille, anatomie, radula) :

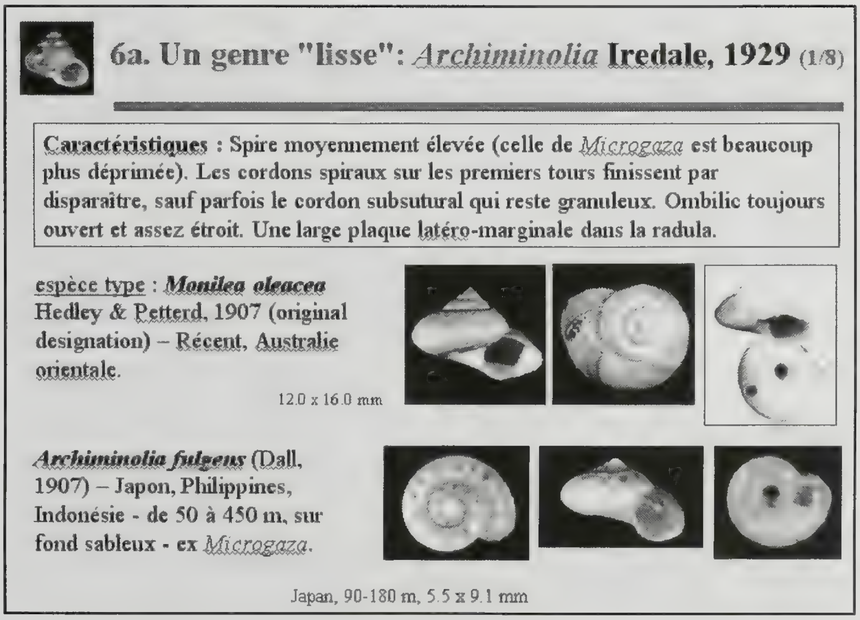

primary cords on first whorls
subsutural spiral cord P1
P2
P3
H
Ha
angle of inner lip with outer lip
spiral cords in the inner third of the base
diameter of umbilicus
W
umbilicus rim
axial pleats around umbilicus
W





notre orateur nous a promené dans les différents genres de la famille :

- le genre type : *Solariella*
- les genres "lisses" : *Archiminolia, Microgaza, Bathymophila,*
- les genres "à cordons" : *Ilanga, Minolia, Spectamen*
- les genres "réticulés" : *Zetela, Lamellitrochus*
- un genre "à part" : *Hazuregyra*



6a. Un genre "lisse": *Archiminolia* Iredale, 1929 (1/8)

Caractéristiques : Spire moyennement élevée (celle de *Microgaza* est beaucoup plus déprimée). Les cordons spiraux sur les premiers tours finissent par disparaître, sauf parfois le cordon subsutural qui reste granuleux. Ombilic toujours ouvert et assez étroit. Une large plaque latéro-marginale dans la radula.

espèce type : ***Monilea oleacea*** Hedley & Petterd, 1907 (original designation) – Récent, Australie orientale.

12.0 x 16.0 mm

Archiminolia fulgens (Dall, 1907) – Japon, Philippines, Indonésie - de 50 à 450 m, sur fond sableux - ex *Microgaza*.

Japan, 90-180 m, 5.5 x 9.1 mm

Nous avons ainsi pu nous rendre compte de la richesse et de la variété de cette famille de "troques", dans laquelle un gros travail reste encore à faire : Claude y œuvre comme d'autres !

Réunion du 25 avril 2010 (CV) → **Etienne Meuleman : Les espèces invasives**

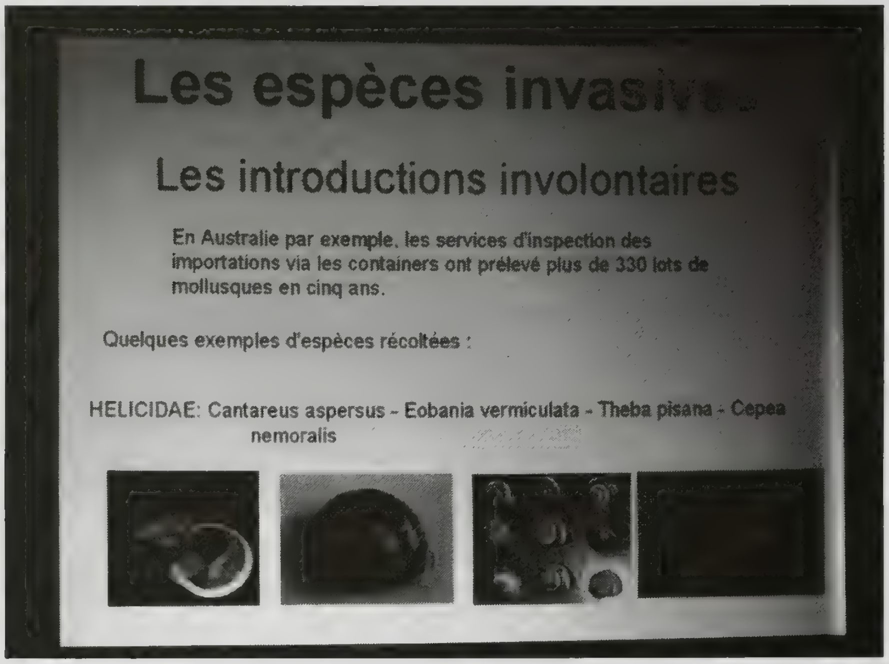
Quelques courageux malacologues et amateurs de la nature, sensibles aux problèmes environnementaux, sont venus écouter ce samedi 25 avril Etienne qui nous a présenté une conférence sur les espèces invasives.

On n'imagine pas le nombre d'espèces qui se retrouvent là où elles ne devraient pas ! Etienne ne s'est pas contenté de présenter quelques espèces invasives de mollusques, mais il a replacé le problème dans un contexte plus général. Ceci nous rappelle que notre Société ne s'intéresse pas uniquement à la collection de coquilles, mais qu'elle essaye également de sensibiliser ses membres aux problèmes environnementaux !

Après quelques définitions, Etienne a passé en revue les causes et les conséquences des invasions d'espèces. Invasions qui peuvent être volontaires ou involontaires et peuvent parfois avoir de graves conséquences sur l'environnement. Par la suite, nous avons pu découvrir l'histoire de quelques mollusques invasifs. Au travers de ces exemples, nous avons découvert que le Canal de Suez était un vecteur important de dispersion des espèces. ou encore que la moule zébrée, *Dreissena polymorpha*, originaire de la Mer Noire, avait envahi l'ouest de l'Europe, le Canada et les Etats-Unis. Cette espèce a colonisé les grands lacs et à certains endroits, on en retrouve près de 700.000 spécimens par mètre cube (étonnant n'est-il pas ?).

La conclusion, sous forme de message, essayait de sensibiliser les gens sur les conséquences parfois catastrophiques de l'introduction de certaines espèces à des fins uniquement commerciales ou dans un but d'enrichissement personnel.

Merci Etienne pour cette présentation, et peut-être y aura-t-il une suite ?



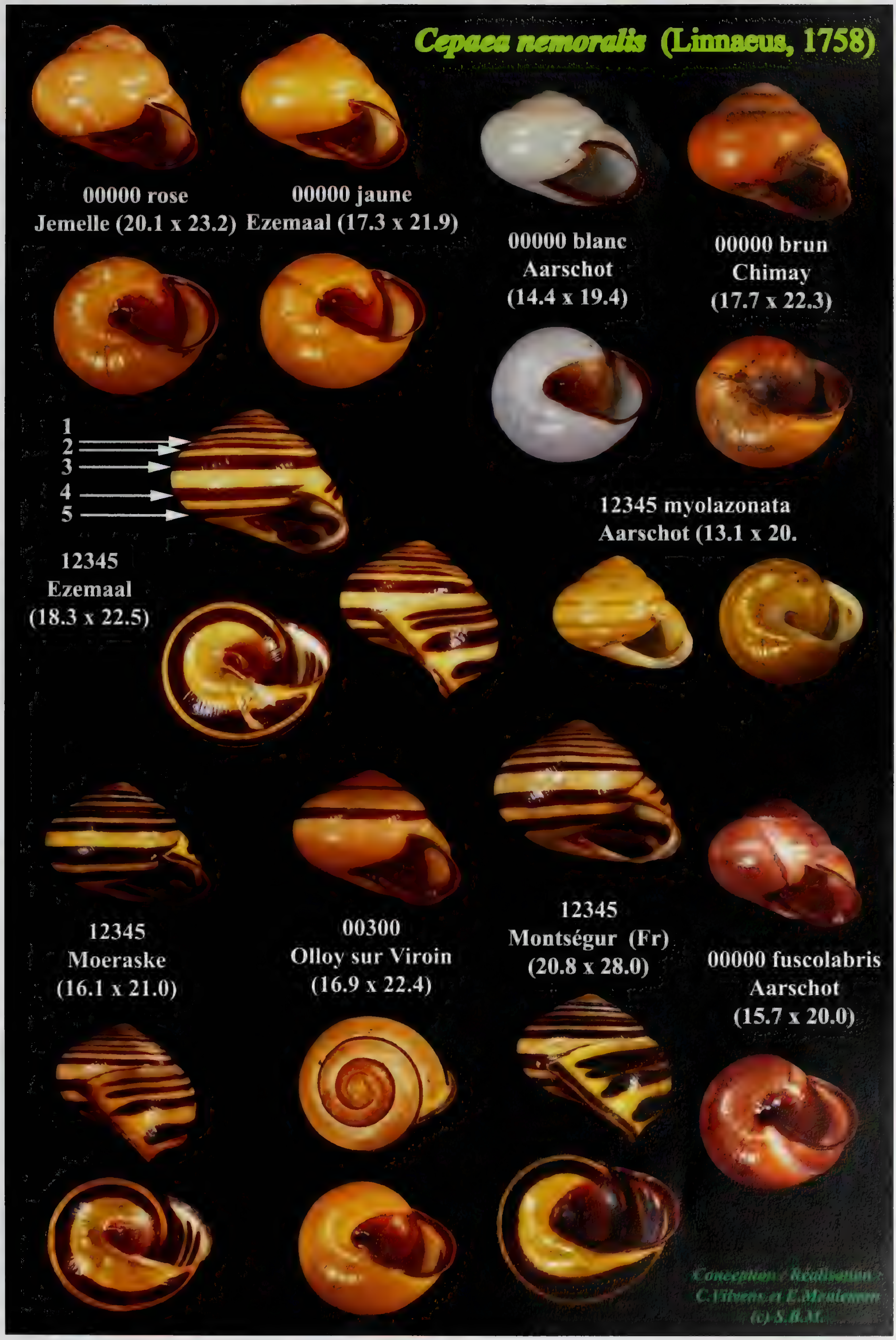
Les espèces invasiv

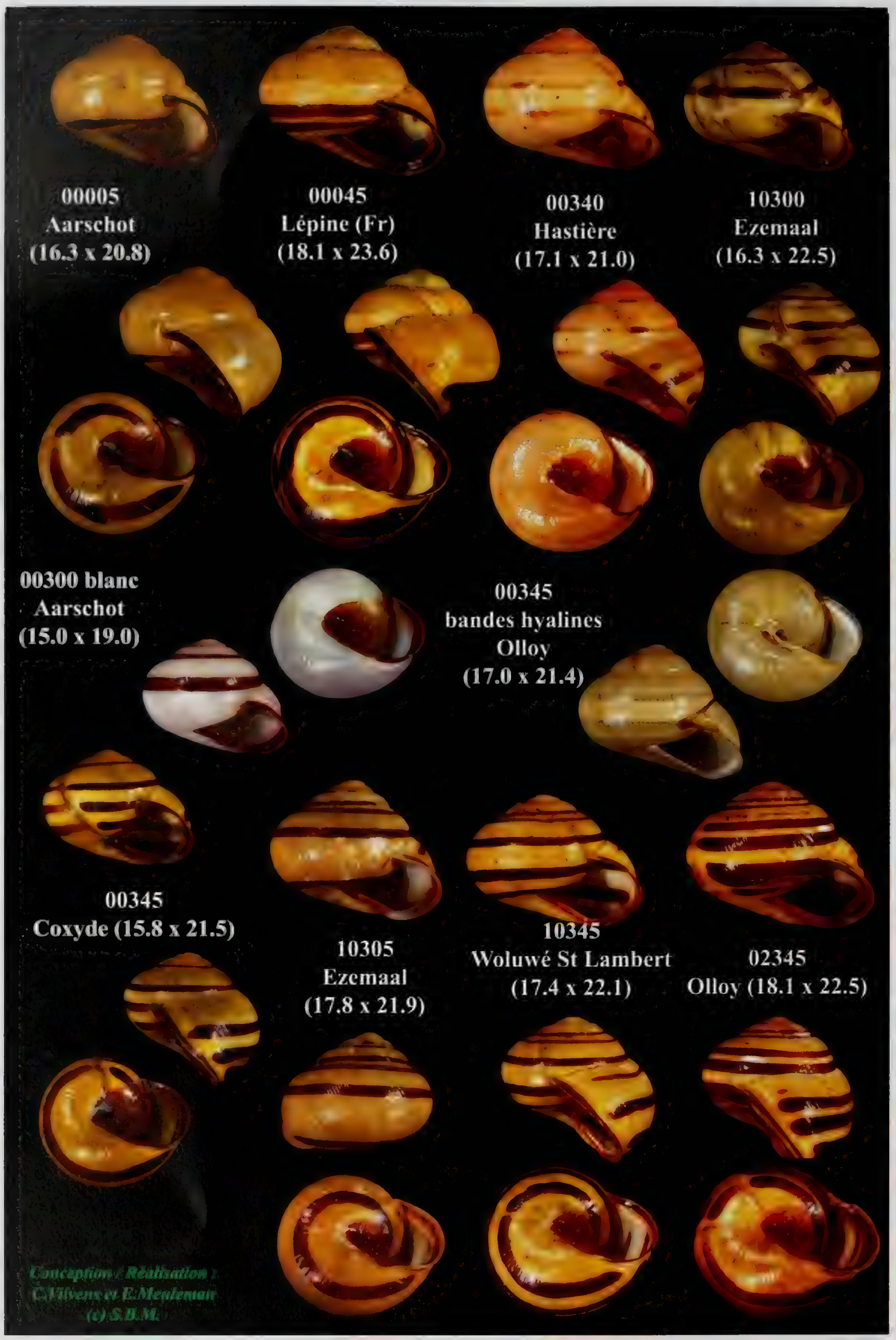
Les introductions involontaires

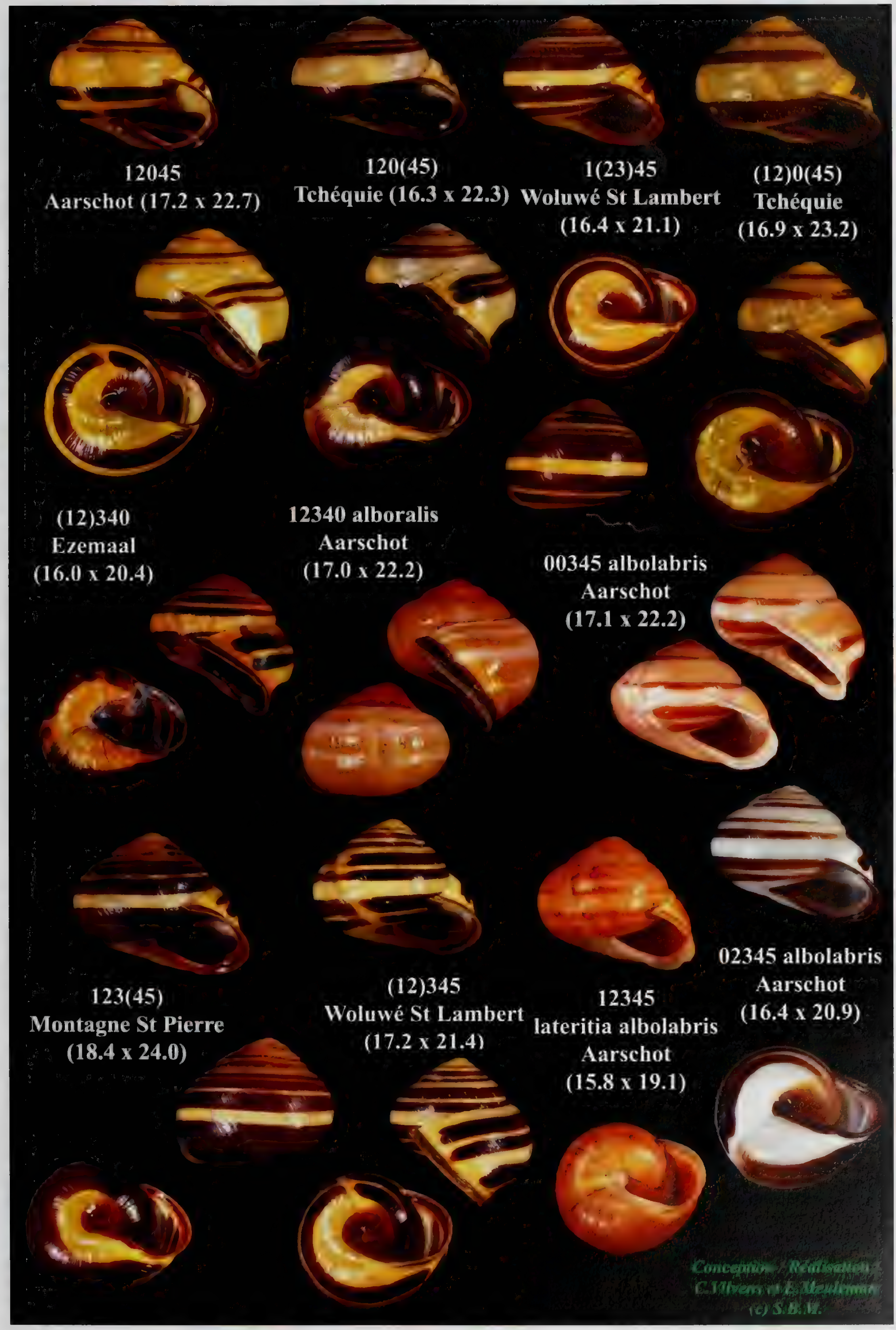
En Australie par exemple, les services d'inspection des importations via les containers ont prélevé plus de 330 lots de mollusques en cinq ans.

Quelques exemples d'espèces récoltées :

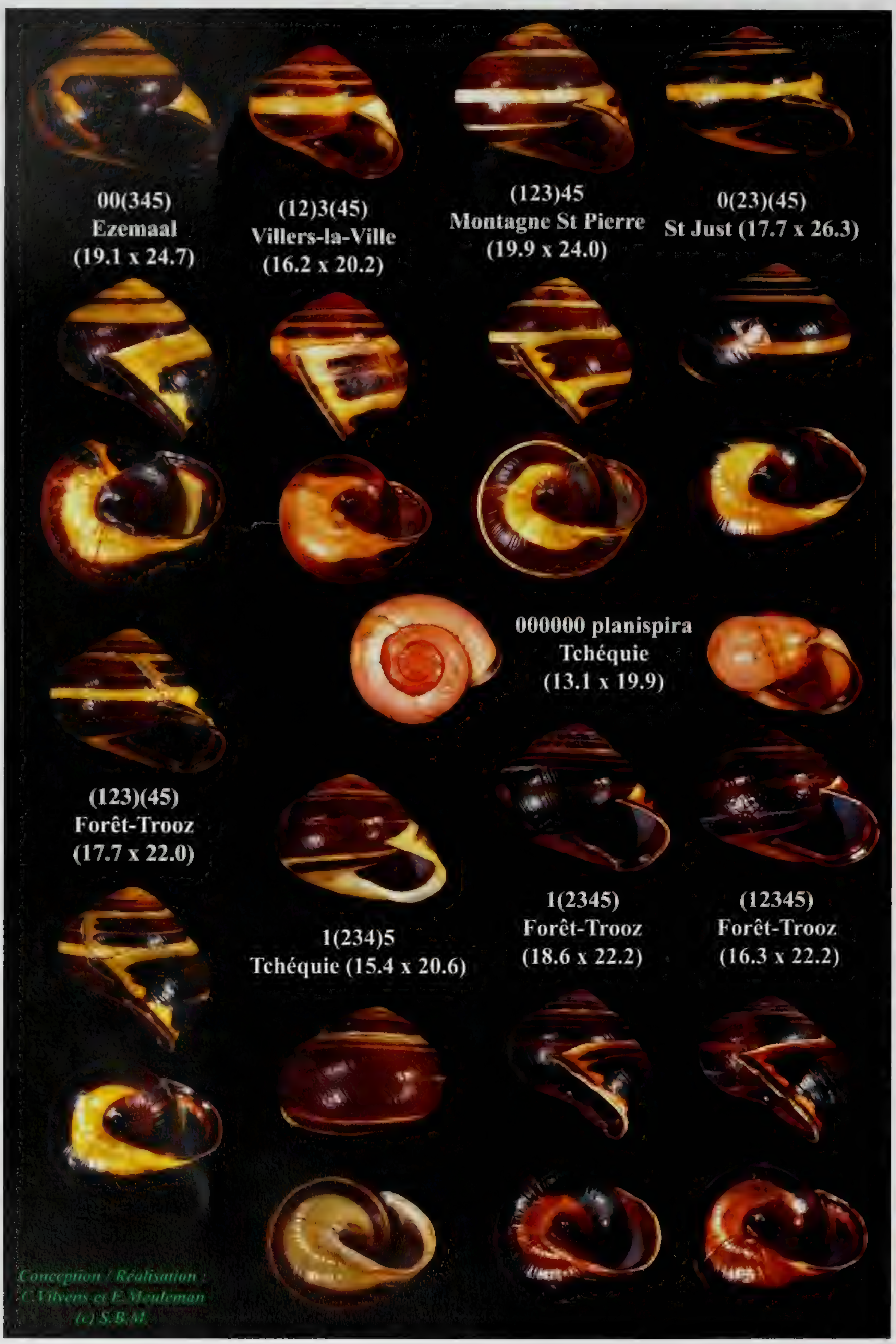
HELICIDAE: Cantareus aspersus - Eobania vermiculata - Theba pisana - Cepea nemoralis


Cepaea nemoralis (Linnaeus, 1758)
00000 rose
Jemelle (20.1 x 23.2)
00000 jaune
Ezemaal (17.3 x 21.9)
00000 blanc
Aarschot
(14.4 x 19.4)
00000 brun
Chimay
(17.7 x 22.3)
1
2
3
4
5
12345
Ezemaal
(18.3 x 22.5)
12345 myolazonata
Aarschot (13.1 x 20.
12345
Moeraske
(16.1 x 21.0)
00300
Olloy sur Viroin
(16.9 x 22.4)
12345
Montségur (Fr)
(20.8 x 28.0)
00000 fuscolabris
Aarschot
(15.7 x 20.0)
Conception / Réalisation :
C.Vilvens et E.Meuleman
(c) S.B.M.


00005
Aarschot
(16.3 x 20.8)
00045
Lépine (Fr)
(18.1 x 23.6)
00340
Hastière
(17.1 x 21.0)
10300
Ezemaal
(16.3 x 22.5)
00300 blanc
Aarschot
(15.0 x 19.0)
00345
bandes hyalines
Olloy
(17.0 x 21.4)
00345
Coxyde (15.8 x 21.5)
10305
Ezemaal
(17.8 x 21.9)
10345
Woluwé St Lambert
(17.4 x 22.1)
02345
Olloy (18.1 x 22.5)
Conception / Réalisation :
C.Vilvens et E.Meuleman
(c) S.B.M.


12045
Aarschot (17.2 x 22.7)
120(45)
Tchéquie (16.3 x 22.3)
1(23)45
Woluwé St Lambert
(16.4 x 21.1)
(12)0(45)
Tchéquie
(16.9 x 23.2)
(12)340
Ezemaal
(16.0 x 20.4)
12340 alboralis
Aarschot
(17.0 x 22.2)
00345 albolabris
Aarschot
(17.1 x 22.2)
123(45)
Montagne St Pierre
(18.4 x 24.0)
(12)345
Woluwé St Lambert
(17.2 x 21.4)
12345
lateritia albolabris
Aarschot
(15.8 x 19.1)
02345 albolabris
Aarschot
(16.4 x 20.9)

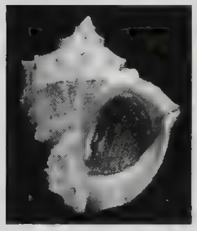
Conception / Réalisation :
C.Vilvens et E.Meuleman
(c) S.B.M.


00(345)
Ezemaal
(19.1 x 24.7)
(12)3(45)
Villers-la-Ville
(16.2 x 20.2)
(123)45
Montagne St Pierre
(19.9 x 24.0)
0(23)(45)
St Just (17.7 x 26.3)
000000 planispira
Tchéquie
(13.1 x 19.9)
(123)(45)
Forêt-Trooz
(17.7 x 22.0)
1(234)5
Tchéquie (15.4 x 20.6)
1(2345)
Forêt-Trooz
(18.6 x 22.2)
(12345)
Forêt-Trooz
(16.3 x 22.2)

Conception / Réalisation :
C.Vilvens et E.Meuleman
(c) S.B.M.

Note : A la recherche de *Rapana venosa* (Valenciennes, 1846) en baie de Quiberon

Christiane DELONGUEVILLE & Roland SCAILLET

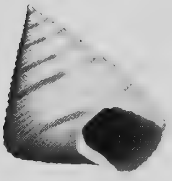


Depuis la fin des années 90 la présence de *Rapana venosa* a été signalée à diverses reprises dans la baie de Quiberon (Morbihan - Bretagne Sud). Une ponte a été trouvée en 2001, ce qui a fait dire à IFREMER qu'une population de l'espèce, quoique peu développée, se serait adaptée au milieu écologique de la baie (une quinzaine d'exemplaires a été signalée jusqu'en 2005).

Depuis, la présence du gastéropode a été mentionnée en 2005 en deux endroits de la mer du Nord, dont l'un pas bien loin de nos eaux territoriales. En 2007, un individu adulte (13,7 cm) a également été trouvé en Galice (Espagne).

Désireux de voir de nos propres yeux ces « nouveaux » mollusques bretons, nous en avons cherché les traces dans les déchets ostréicoles de l'Anse du Pô à Carnac, sans succès. Une rapide enquête menée auprès de quelques ostréiculteurs de la région (mars 2010) nous a appris que la présence du mollusque était connue. L'association professionnelle des éleveurs d'huîtres avait en effet signalé à ses membres travaillant dans la région la présence de *Rapana venosa* par 5 mètres de fond. Les quelques professionnels interrogés étaient effectivement informés, mais aucun d'eux n'avait personnellement récolté de spécimens et n'a donc pu nous faire voir ce nouvel envahisseur.

Il est donc à espérer que *Rapana venosa* n'ait connu qu'un succès éphémère dans la région et que sa reproduction se soit limitée à quelques tentatives sans grand avenir. Ce serait là une bonne nouvelle car une fois implanté, l'animal est capable de causer de graves dommages à la faune de bivalves sauvages ou de culture.



Quoi de neuf ?

Michel GHESQUIERE

L' Association Conchyliologique du Nord
avec
le concours de la ville de Faches-Thumesnil

vous souhaitent la :

« BIENVENUE CHEZ LES CH'TIS »
pour les :

14 èmes
Journées Internationales des Coquillages

BOURSE / EXPOSITION 2010
Les : 09 et 10 octobre 2010

Salle des Fêtes : Jacques Brel
Rue du Général Hoche
à Faches-Thumesnil
Sud de Lille

Informations, renseignements et inscriptions
Mr. Michel GHESQUIERE
97 Route de Wervicq 59560 Comines
Tél. : 03.20.39.09.13
e-mail : mghesquiere@neuf.fr

- Bourse ouverte à tous les collectionneurs sans obligation d' adhésion à une association.
- Prix des tables inchangé depuis 4 ans : 12 €/m ou 22 € la table (Suivant matériel fourni)
- Possibilité de réserver un plateau repas le samedi et le dimanche midi.(~12 €) et de participer à un repas d' amitié le samedi soir. (~27 €)
- Exposition avec près de 30 thèmes présentés.
- Grande salle, surveillée la nuit, avec vaste parking.
- Entrée : 1 €. Tombola avec tous les tickets d' entrée

Quelques nouvelles publications

Roland HOUART

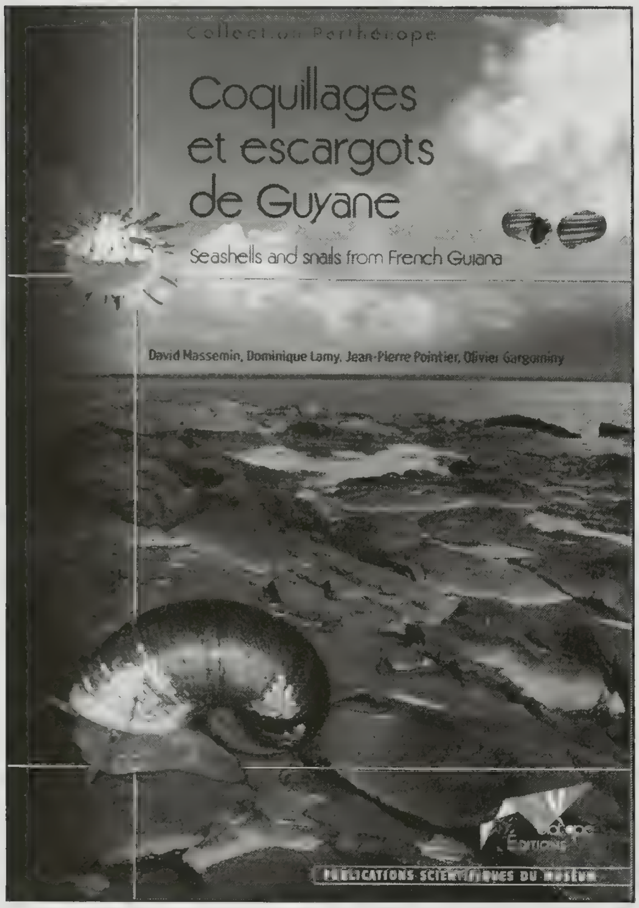
COQUILLAGES ET ESCARGOTS DE GUYANE

(Seashells and snails from French Guiana)

par **David Massemin, Dominique Lamy, Jean-Pierre Pointier et Olivier Gargominy**

pp. 1-456, nombreuses photographies et planches couleurs
En partie bilingue français-anglais.
Format 165 x 240 mm, couverture souple.
Prix : 70 euros + frais d'envoi.

Biotope Editions/publications scientifiques du Muséum.
www.biotope.fr
parthenope@biotope.fr


Collection Parthénope
Coquillages et escargots de Guyane
Seashells and snails from French Guiana
David Massemin, Dominique Lamy, Jean-Pierre Pointier, Olivier Gargominy
Éditions
PUBLICATIONS SCIENTIFIQUES DU MUSÉUM

Voici un livre qui en ravira plus d'un, malacologue, amateur, professionnel, ou simplement amoureux de la nature.

Dans une très belle finition, ce livre se présente comme un petit bijou à insérer précieusement dans sa bibliothèque, ou … à offrir.

Les auteurs sont connus pour leurs écrits et leur rigueur scientifiques et ne nous décevront certainement pas avec cette publication.

Après un résumé présentant l'aire d'étude, le peuplement en mollusques et le mode d'emploi du guide, l'introduction regroupe les remerciements d'usage et la présentation des auteurs. La présentation générale nous relate l'historique des prospections malacologiques dans la région; une définition des mollusques; la présentation de la région explorée, carte et photos couleurs à l'appui; le peuplement des faunes malacologiques marines, terrestres et dulcicoles, accompagné de nombreuses photographies *in situ*, et l'homme et les mollusques en Guyane, pour aboutir à la deuxième partie du livre: le guide des espèces. Celui-ci, à l'aide de diverses clés dichotomiques illustrées, nous guide à travers les différents critères de détermination.

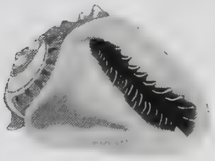
La partie systématique nous offre la présentation des 671 espèces répertoriées en Guyane: mollusques marins, dulcicoles et terrestres. Chaque espèce est présentée, quelquefois avec sa synonymie, sa diversité de taille, son écologie, sa répartition géographique et son statut en Guyane. Le tout accompagné de photos ou de dessins. Un certain nombre d'espèces n'est malheureusement pas illustré, c'est un des seuls points négatifs que l'on peut regretter dans un livre, par ailleurs très bien documenté.

Les coquilles photographiées nous sont présentées sur fond noir, soit comme figure dans le texte, soit regroupées par planche. Les photos sont excellentes et sont soit accompagnées, soit remplacées par des dessins mettant quelques détails en exergue, notamment les empreintes musculaires chez les bivalves ou des détails de l'ouverture chez les gastéropodes. De nombreux mollusques dulcicoles et terrestres sont photographiés *in situ*.

Des cartes de distribution sont incluses pour les espèces dulcicoles et terrestres. Le livre se termine par la bibliographie, un glossaire, la liste des espèces appartenant à la malacofaune de Guyane et par un index scientifique.

Un livre, non seulement à insérer dans sa bibliothèque mais également à consulter fréquemment.

Roland Houart



Nous avons reçu

Etienne MEULEMAN

LES NATURALISTES
DE LA
HAUTE LESSE

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°250, novembre-décembre 2009

SOMMAIRE	Page
Calendrier des activités	2
Comptes rendus des activités	
Sortie cécidologique à Habay-la-Neuve	4
Sortie d'initiation à la mycologie et d'intérêt général	6
Sortie botanique à Kuringen (Hasselt)	8
Sortie mycologique à Wavreille : Fond de Thyon, Bois de Wève	10
Observations ornithologiques à Wiesme (3)	12
Promenade mycologique dans le Bois Banal à Wavreille	13
Sortie d'intérêt général et calcul de l'indice biotique de quelques affluents de l'Our (2)	15
Repas automnal des Naturalistes de la Haute-Lesse	19
Chroniques de l'environnement	
Our (Paliseul) - Aire de dépôts de matériaux de chantier en milieu forestier	20
Travaux des membres	
Nouvelles de nos orchidées.	21
Les malheurs de *Succinea putris.*	29
Informations aux membres	
NEW ! Les échos du Comité	31

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°251, janvier-février 2010

Sommaire	Page
Calendrier des activités	2
Comptes rendus des activités	
La Haie Gabaux à Doische	4
La gestion forestière des forêts publiques. Notions générales - Smuid (Libin)	6
Mycologie à Resteigne et Ave-et-Auffe	9
Prospection et évaluation biologique du Ri de la Fosse (Harsin-Ambly-Nassogne) et de ses affluents	11
Observations ornithologiques à Wiesme (4)	14
Observation des oiseaux au Lac du Der et environs	15
Promenade familiale du dimanche après-midi : l'énigme du Ry d'Ave	18
Sortie bryologique d'initiation à Neupont (Redu)	21
Observations ornithologiques à Wiesme (annulée)	24
Traces de mammifères et autres ... (Auffe)	24
Chroniques de l'environnement	
La mare de Sohier enfin curée !	25
Rencontre avec Monsieur Louis-Marie Piron	26
Travaux des membres	
Clé de détermination au stade végétatif des herbacées à grandes feuilles palmées	27
Informations aux membres	
Assemblée Générale	28

GLORIA MARIS

(Belgique néerlandophone)
Vol. 48, N°4-5, novembre 2009

CONTENTS

1. *Koen Fraussen, Bunjamin Dharma & Peter Stahlschmidt*
   Recent and fossil: *Nassaria nebulonis* sp. nov. from Indonesia (Gastropoda: Buccinidae)

2. *Jan Deprez & Frederick Govaert*
   Zonaria pyrum nigromarginata: A new subspecies of *Zonaria pyrum* (Gastropoda: Cypraeidae) from the Atlantic coast of the Iberian Peninsula

3. *Koen Fraussen*
   A new *Antillophos* (Gastropoda: Buccinidae) from the Philippines

4. *Hugo H. Kool*
   Nassarius coriolis sp. nov., a deep water species from Philippine waters (Gastropoda: Nassariidae)

5. *Kevin Monsecour & David Monsecour*
   A new species of *Anachis* (Gastropoda: Neogastropoda: Columbellidae) from the Philippines

6. *Winfried Engl, Ramón Gómez, Anselmo Peñas, Frank Swinnen & Emilio Rolán*
   New records of molluscs for the Canary Islands

7. *Ferdy Jacobs & Marc Hansen*
   Hygromia cinctella (Draparnaud,1801) (Gastropoda: Hygromiidae):
   Een nieuwe soort voor de Belgische fauna

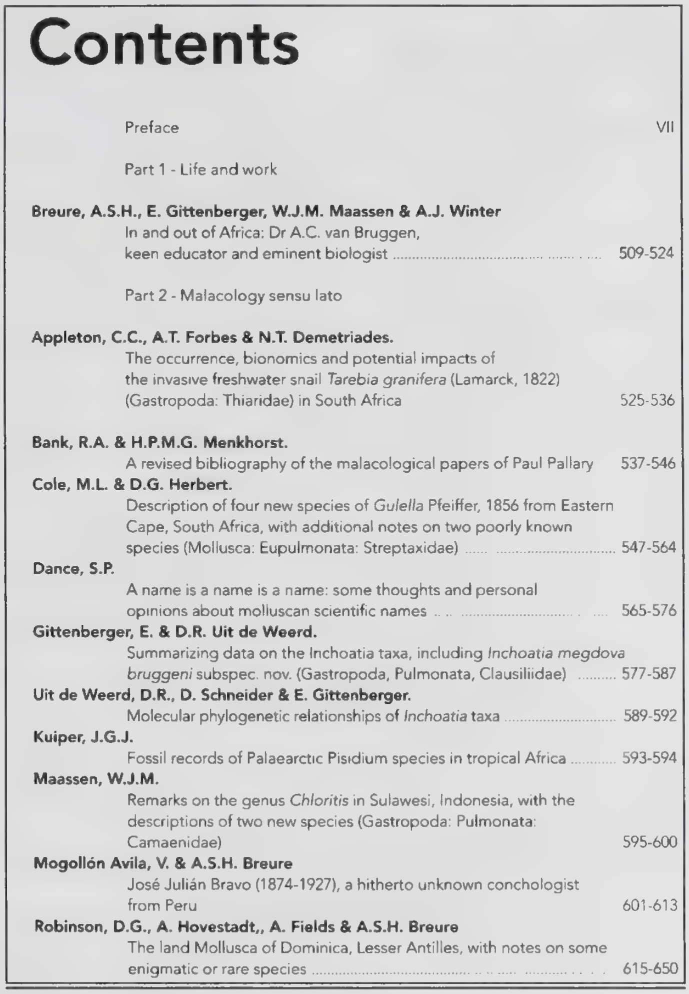
8. *Willy Segers*
   The rediscovery of *Epitonium linctum*
   (de Boury & Monterosato, 1890), in the Bay of Biscay

ERRATA

In the previous issue, the Volume number was indicated as Vol. 49(2-3). This should be changed into Vol. 48(2-3). The editor apologizes for the inconvenience.

ZOOLOGISCHEN MEDEDELINGEN

(Pays-Bas)
Vol. 83, N°3-21, juillet 2009



Contents

Preface VII

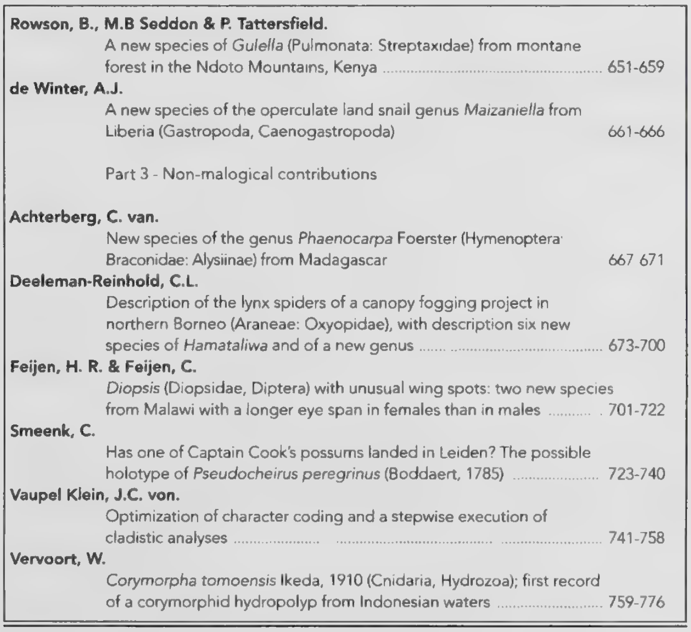
Part 1 - Life and work

Breure, A.S.H., E. Gittenberger, W.J.M. Maassen & A.J. Winter
In and out of Africa: Dr A.C. van Bruggen, keen educator and eminent biologist 509-524

Part 2 - Malacology sensu lato

Appleton, C.C., A.T. Forbes & N.T. Demetriades.
The occurrence, bionomics and potential impacts of the invasive freshwater snail *Tarebia granifera* (Lamarck, 1822) (Gastropoda: Thiaridae) in South Africa 525-536

Bank, R.A. & H.P.M.G. Menkhorst.
A revised bibliography of the malacological papers of Paul Pallary 537-546
Cole, M.L. & D.G. Herbert.
Description of four new species of *Gulella* Pfeiffer, 1856 from Eastern Cape, South Africa, with additional notes on two poorly known species (Mollusca: Eupulmonata: Streptaxidae) 547-564
Dance, S.P.
A name is a name is a name: some thoughts and personal opinions about molluscan scientific names 565-576
Gittenberger, E. & D.R. Uit de Weerd.
Summarizing data on the Inchoatia taxa, including *Inchoatia megdova bruggeni* subspec. nov. (Gastropoda, Pulmonata, Clausiliidae) 577-587
Uit de Weerd, D.R., D. Schneider & E. Gittenberger.
Molecular phylogenetic relationships of *Inchoatia* taxa 589-592
Kuiper, J.G.J.
Fossil records of Palaearctic Pisidium species in tropical Africa 593-594
Maassen, W.J.M.
Remarks on the genus *Chloritis* in Sulawesi, Indonesia, with the descriptions of two new species (Gastropoda: Pulmonata: Camaenidae) 595-600
Mogollón Avila, V. & A.S.H. Breure
José Julián Bravo (1874-1927), a hitherto unknown conchologist from Peru 601-613
Robinson, D.G., A. Hovestadt,, A. Fields & A.S.H. Breure
The land Mollusca of Dominica, Lesser Antilles, with notes on some enigmatic or rare species 615-650



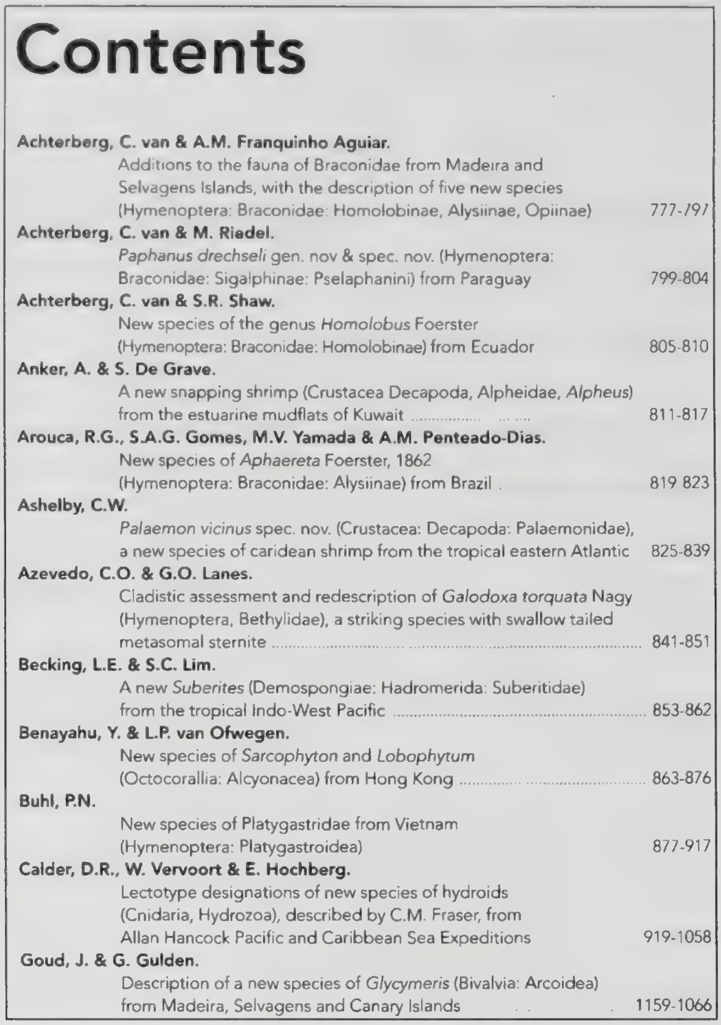
Rowson, B., M.B Seddon & P. Tattersfield.
A new species of *Gulella* (Pulmonata: Streptaxidae) from montane forest in the Ndoto Mountains, Kenya 651-659
de Winter, A.J.
A new species of the operculate land snail genus *Maizaniella* from Liberia (Gastropoda, Caenogastropoda) 661-666

Part 3 - Non-malogical contributions

Achterberg, C. van.
New species of the genus *Phaenocarpa* Foerster (Hymenoptera: Braconidae: Alysiinae) from Madagascar 667 671
Deeleman-Reinhold, C.L.
Description of the lynx spiders of a canopy fogging project in northern Borneo (Araneae: Oxyopidae), with description six new species of *Hamataliwa* and of a new genus 673-700
Feijen, H. R. & Feijen, C.
Diopsis (Diopsidae, Diptera) with unusual wing spots: two new species from Malawi with a longer eye span in females than in males 701-722
Smeenk, C.
Has one of Captain Cook's possums landed in Leiden? The possible holotype of *Pseudocheirus peregrinus* (Boddaert, 1785) 723-740
Vaupel Klein, J.C. von.
Optimization of character coding and a stepwise execution of cladistic analyses 741-758
Vervoort, W.
Corymorpha tomoensis Ikeda, 1910 (Cnidaria, Hydrozoa); first record of a corymorphid hydropolyp from Indonesian waters 759-776

ZOOLOGISCHEN MEDEDELINGEN

(Pays-Bas)
Vol. 83, N°22-34, août 2009



Contents

Achterberg, C. van & A.M. Franquinho Aguiar.
Additions to the fauna of Braconidae from Madeira and Selvagens Islands, with the description of five new species (Hymenoptera: Braconidae: Homolobinae, Alysiinae, Opiinae) 777-797

Achterberg, C. van & M. Riedel.
Paphanus drechseli gen. nov & spec. nov. (Hymenoptera: Braconidae: Sigalphinae: Pselaphanini) from Paraguay 799-804

Achterberg, C. van & S.R. Shaw.
New species of the genus *Homolobus* Foerster (Hymenoptera: Braconidae: Homolobinae) from Ecuador 805-810

Anker, A. & S. De Grave.
A new snapping shrimp (Crustacea Decapoda, Alpheidae, *Alpheus*) from the estuarine mudflats of Kuwait 811-817

Arouca, R.G., S.A.G. Gomes, M.V. Yamada & A.M. Penteado-Dias.
New species of *Aphaereta* Foerster, 1862 (Hymenoptera: Braconidae: Alysiinae) from Brazil . 819 823

Ashelby, C.W.
Palaemon vicinus spec. nov. (Crustacea: Decapoda: Palaemonidae), a new species of caridean shrimp from the tropical eastern Atlantic 825-839

Azevedo, C.O. & G.O. Lanes.
Cladistic assessment and redescription of *Galodoxa torquata* Nagy (Hymenoptera, Bethylidae), a striking species with swallow tailed metasomal sternite 841-851

Becking, L.E. & S.C. Lim.
A new *Suberites* (Demospongiae: Hadromerida: Suberitidae) from the tropical Indo-West Pacific 853-862

Benayahu, Y. & L.P. van Ofwegen.
New species of *Sarcophyton* and *Lobophytum* (Octocorallia: Alcyonacea) from Hong Kong 863-876

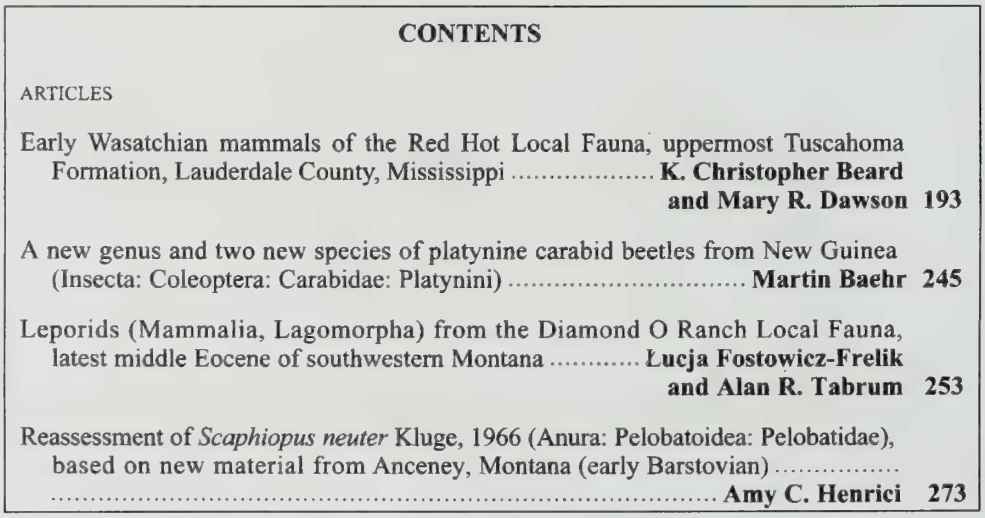
Buhl, P.N.
New species of Platygastridae from Vietnam (Hymenoptera: Platygastroidea) 877-917

Calder, D.R., W. Vervoort & E. Hochberg.
Lectotype designations of new species of hydroids (Cnidaria, Hydrozoa), described by C.M. Fraser, from Allan Hancock Pacific and Caribbean Sea Expeditions 919-1058

Goud, J. & G. Gulden.
Description of a new species of *Glycymeris* (Bivalvia: Arcoidea) from Madeira, Selvagens and Canary Islands . . . 1159-1066

ANNALS OF CARNEGIE MUSEUM

(U.S.A. – Pennsylvanie)
Vol. 78, N° 3, novembre 2009



CONTENTS

ARTICLES

Early Wasatchian mammals of the Red Hot Local Fauna, uppermost Tuscahoma Formation, Lauderdale County, Mississippi .... **K. Christopher Beard and Mary R. Dawson** 193

A new genus and two new species of platynine carabid beetles from New Guinea (Insecta: Coleoptera: Carabidae: Platynini) .... **Martin Baehr** 245

Leporids (Mammalia, Lagomorpha) from the Diamond O Ranch Local Fauna, latest middle Eocene of southwestern Montana .... **Łucja Fostowicz-Frelik and Alan R. Tabrum** 253

Reassessment of *Scaphiopus neuter* Kluge, 1966 (Anura: Pelobatoidea: Pelobatidae), based on new material from Anceney, Montana (early Barstovian) .... **Amy C. Henrici** 273

SPIRULA

(Pays-Bas)
N° 371, novembre-décembre 2009

	Voorplaat	137
Diverse bronnen	Malacologische agenda - 2010	137
Bosch, W.	De schelpencollectie van het Pieter Vermeulen Museum	138
Gemert, L.J. van	De publieke schelpencollecties in Nederland	138-139
Cadée, G.C.	Japanse oester doodsoorzaak alikruiken?	140
Bruggen, A.C. van	Een woord van dank voor de speciale vergadering van de 26e september 2009	141
Stikvoort, E.C.	De slikken van Viane, verboden gebied	141
Gulden, G. & J. Weisscher	9e Internationale Schelpenbeurs en Symposium in Muzee Scheveningen.op 17 en 18 april 2010	142-143
Kronenberg, G,C,	Wanneer is iets het tweede supplement?	143
Penningmeester	Beloning € 5,00 / A € 5.00 reward	144
Buijse, J.	Bestuurslid gevraagd voor Stibeman	144
Peursen, A. van	Excursieprogramma NMV 2010	144
Diverse bronnen	Excursies 2010	144
Faber, W.	Wisseling van de wacht	144
Poorten, J.J. ter & J. Buise	Jubileumvergadering op 21 november 2009 (fotoreportage)	145
Poorten, J.J. ter	Groepsfoto	146-147
Janssen, T. & W. Faber	Vondst van de blauwgestreepte schaalhoorn in de Waddenzee	146-147
[Mienis, H.K.]	Schelpen en slavenhandel	147
Faber, W.	Nieuwe weekdiersoorten (schelpen)	148-149
Vlag, F. van der	Zoekertje	149
Leeuwen, S. van	De soorten van Baster, Slabbe en Bomme	149
Faber, W.	Tijdschriftartikelen	150-153
Faber, W.	Nieuwe boeken	154-155
Faber, W.	Weekdieren op postzegels	155
Diverse bronnen	Schelpenbeurzen en bijeenkomsten	156

THE CHIROBOTAN

ちりぼたん

(Japon)
Vol. 40, N°1, 2009

Hiroshi Minato. *Placeophaedusa expansilabris carnea* (Pulmonata, Clausiliidae) in the Kii mountain range, Japan. 1
Hiroshi Minato. *Selenoptyx noviluna* (Pilsbry, 1908) (Pulmonata: Clausiliidae) from Mt. Nekumachiji, Kunigami, Okinawa Island, Japan. 8
Yoshimasa Hayase, Shinpei Ueno, Yasuyuki Matsunaga & Taro Shakema. New distribution record of *Pseudopythina macrophthalmensis* Morton & Scott, 1989 from northern part of Suruga Bay, Kuzura, Numazu City, Shizuoka Prefecture, central Japan. 15
Takeharu Kosuge & Katsuhiro Kiso. Shells of *Pseudopythina macrophthalmensis* (Galeommatoidea) found in the gut of the Spangled Emperor Fish *Lethrinus nebulosus* (Lethrinidae) captured near the Yaeyama Islands, Okinawa, Japan. 20
Takashi Matsubara, Takenori Sasaki & Yasuhiro Ito. Illustrations of Cenozoic molluscan type specimens preserved in the University Museum, the University of Tokyo. Part 4. The genus *Kaneharaia* (Bivalvia: Veneridae). 23
Takenori Sasaki, Takashi Matsubara, Yasuhiro Ito & Kazutaka Amano. Illustrations of Cenozoic molluscan type specimens preserved in The University Museum, The University of Tokyo. Part 5. Fissurellidae (Vetigastropoda). 29

2009年12月10日 December 10, 2009

発 行 〒169-0073 東京都新宿区百人町3-23-1 国立科学博物館分館内 日本貝類学会
Malacological Society of Japan, c/o National of Nature and Science Museum 3-23-1, Hyakunin-cho, Shinjuku-ku, Tokyo, 169 - 0073. Japan.

編 集 〒113-0033 東京都文京区本郷7-3-1 東京大学総合研究博物館 佐々木猛智
Editor: Takenori Sasaki, The University Museum, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan.
e-mail: sasaki@um.u-tokyo.ac.jp

印 刷 〒381-0023 長野県長野市大字風間 2034 番地16 栄光社印刷株式会社

BOLLETINO MALACOLOGICO

(Italie)
Vol. 45, N° 2, novembre 2009

Indice

49 *Morena Tisselli, Franco Agamennone & Luigi Giunchi*
Una nuova specie di *Gibberula* (Gastropoda: Cystiscidae) per il Mediterraneo

55 *M. Mauro Brunetti, Giano Della Bella, Maurizio Forli & Giuseppe Vecchi*
La famiglia Cancellariidae Forbes & Hanley, 1851 (Gastropoda) nel Plio-Pleistocene italiano: i generi *Bonellitia*, *Pseudobabylonella* n. gen., *Admete* e *Cancellicula* Tabanelli, 2008, con descrizione di tre nuove specie

83 *Gianbattista Nardi*
Una nuova sottospecie di *Chondrina megacheilos* (De Cristofori & Jan, 1832) per le Prealpi Bresciane (Gastropoda, Pulmonata, Chondrinidae)

95 *Alberto Cecalupo*
Cerithium balletoni n. sp. from Tuamotu Archipelago (French Polynesia) (Gastropoda, Cerithiidae)

99 *Erminio Caprotti*
La metafora dell'ostrica e la condizione umana

105 *Maurizio Sosso, Bruno Dell'Angelo & Antonio Bonfitto*
Una nuova specie di *Pseudoscilla* (Gastropoda, Pyramidellidae) dal Pliocene della Liguria

109 *Vitaliy Anistratenko, Bruno Dell'Angelo, Zoltán Vicián & Olga Anistratenko*
First record of *Tectura compressiuscula* (Patellogastropoda, Lottiidae) from the Middle Miocene of Hungary

115 *Bret Raines & Mauro Pizzini*
Two new Caecidae from the South-West Pacific Ocean and the "*Caecum insculptum* complex" (Caenogastropoda: Rissooidea)

121 *Erminio Caprotti*
Osservazioni su *Dentalium inaequale* Bronn, 1831 (Scaphopoda)

123 *David P. Cilia*
On the presence of the alien freshwater gastropod *Ferrissia fragilis* (Tryon, 1863) (Gastropoda: Planorbidae) in the Maltese Islands (Central Mediterranean)

129 *Ricardo Silva Absalão & Francisco José Garcia Garcia*
Anatomy of *Olivella* (*Lamprodoma*) *volutella* (Lamarck, 1811) (Gastropoda, Olividae), a Panamanian Pacific species

BOLLETINO MALACOLOGICO

(Italie)
Vol. 45, supplément 2009

Indice

1 *Giambattista Bello & Rafael La Perna*
Prefazione / *Foreword*

3 *Giambattista Bello & Sigurd v. Boletzky*
In onore di Vinicio Biagi (1936-2004) / *In honour of Vinicio Biagi (1936-2004)*

7 *Domenico Capua*
In memoriam. Vinicio Biagi (1936-2004) / *In memoriam. Vinicio Biagi (1936-2004)*

9 *Alberto Villari & Giovanni Ammendolia*
On a beached specimen of *Octopoteuthis sicula* (Cephalopoda: Octopoteuthidae) in the Straït of Messina

13 *Lidia Orsi Relini*
Notes about colour displays observed in female specimens of *Tremoctopus* (Cephalopoda: Octopoda) and their taxonomic value

17 *Paolo Sartor & Paola Belcari*
Opisthoteuthis calypso (Cephalopoda: Octopoda) collected on bathyal bottoms of the northern Tyrrhenian Sea (western Mediterranean)

23 *Domenico Capua, Paolo Sartor, Riccardo Sirna & Alessandro Voliani*
On a large specimen of *Histioteuthis bonnellii* (Cephalopoda: Histioteuthidae) caught in the northern Tyrrhenian Sea, western Mediterranean

27 *Lidia Orsi Relini, Alessandro Mannini, Luca Lanteri & Eugenio Beccornia*
First record of an egg mass of *Loligo forbesi* (Cephalopoda: Loliginidae) in the Ligurian Sea, with notes about egg laying patterns in southern populations

35 *Vinicio Biagi & Giambattista Bello*
Occurrence of an egg mass of *Thysanoteuthis rhombus* (Cephalopoda: Teuthida) in the Strait of Messina (Italy), locus typicus of the species

39 *Sigurd v. Boletzky*
Records of cephalopod eggs and embryos: what do we need?

43 *Pilar Sanchez*
One century of teuthological records from the Catalan sea

47 *Alp Salman*
Cephalopod research in the eastern Mediterranean (East of 23°E): a review

61 *Elisa Ciavaglia & Chiara Manfredi*
Distribution and some biological aspects of cephalopods in the North and Central Adriatic

71 *Gian Maria Balducci & Corrado Piccinetti*
Distribution of juvenile cephalopods collected during a survey on tuna larvae in the Mediterranean Sea (1994)

81 *Alessandro Voliani, Danila Cuccu, Fabio Fiorentino, Daniela Giordano & Alessandro Mannini*
An updated review of the occurrence of *Bathypolypus sponsalis* (Cephalopoda: Octopodidae) in the Italian seas and notes on its distribution in the Mediterranean

87 *Adrianne Deickert*
Reproductive mode in the genus *Sepietta* (Cephalopoda: Sepiolidae)

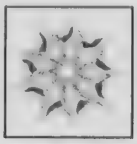
95 *Vladimir Laptikhovsky, João Pereira, Alp Salman, Alexander Arkhipov & Ana Costa*
A habitat-dependence in reproductive strategies of cephalopods and pelagophile fish in the Mediterranean Sea

103 *Danila Cuccu, Patrizia Jereb, Sergio Ragonese, Nicola Giovannini, Simone Colella & Angelo Cau*
On the abundance and spatial distribution of *Illex coindetii* (Cephalopoda: Ommastrephidae) and *Eledone moschata* (Cephalopoda: Octopodidae) in the Sardinian Seas (central-western Mediterranean) - A preliminary and qualitative investigation with special attention to some environmental constraints

111 *Patrizia Jereb & Sabrina Agnesi*
Current state of knowledge on exploited cephalopods in the Italian waters

AMERICAN CONCHOLOGIST

(U.S.A. Sud-Est)
Vol. 37, N° 4, décembre 2009



IN THIS ISSUE

Editor's Comments -- 3

Live Shells From the Gulf of Aqaba in the Red Sea by Kovis Moti -- 4

2010 Shell Shows and Related Events by Donald Dan --------- 7

Sea Shell Searchers of Brazoria County Shell Show Awards -- 8

In Memoriam --- 8

Discovery of the *Conus lightbourni* Petuch, 1986 holotype by Elizabeth K. Sheal and William J. Fenzan ------------------9

Scientists at FAU's Harbor Branch Oceanographic Institute are the First to 'Unlock' the Mystery of Creating High-quality Cultured Pearls From the Queen Conch By Gisele Galoustian ---------------------------- 12

Dealer Directory -- 15

Book Review: "George Brettingham Sowerby, I, II, III: their conchological publications and Molluscan taxa" ------- 18

Edgar Allen Poe: Conchologist by Tom Eichhorst -------------19

Black and White and Red All Over: A Cone-Seeking Odyssey to Roatan, Honduras by Karen VanderVen ---------- 22

Collecting Shells: A Passion, Joy, and Mission by Zvi Orlan -- 27

Shell-abration Boston: COA 2010 ------------------------------ 28

THE FESTIVUS

(U.S.A. – Californie)
Vol. XLII, N°1, janvier 2010

CONTENTS

Club news 2
New insight on galeommatid bivalves (Bivalvia, Galeommatoidea, Lasaeidae) described by Olsson, 1961, from the Panamic Province
PAUL VALENTICH-SCOTT 3
John D. Jackson (1941-2009)
LARRY BUCK 10
A selected index to Volume XLI (2009)
JULES HERTZ, preparer 11
Low tides for 2010 at San Felipe, Baja California, México
JULES HERTZ, preparer 12

THE FESTIVUS

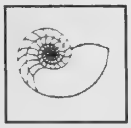
(U.S.A. – Californie)
Vol. XLII, N°2, février 2010

CONTENTS

Club news 14, 27
Cirsotrema togatum Hertlein & Strong, 1951 (Gastropoda: Epitoniidae), a variable species or three distinct species? A preliminary study
CAROL SKOGLUND & CAROLE M. HERTZ 15
The Fourteenth Annual SCUM meeting
JULES HERTZ 26
2010 Mission Bay Tides
PAUL TUSKES, preparer 28
Roster for detaching

THE NAUTILUS

(U.S.A.)
Vol. 123, N°4, décembre 2009



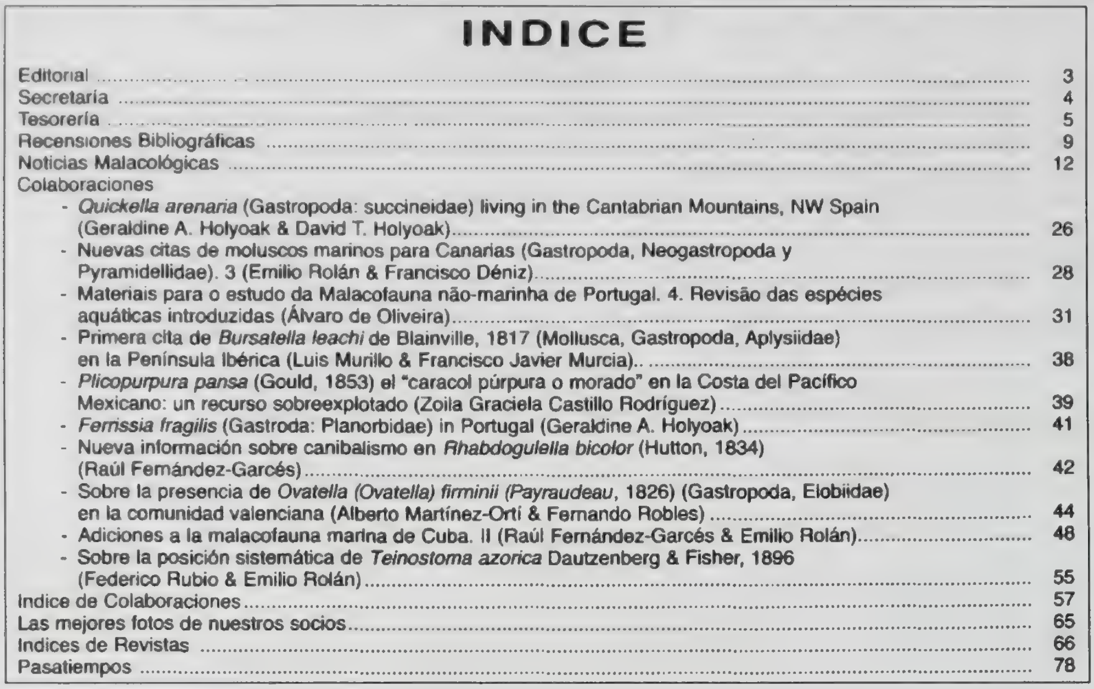
Volume 123, Number 4
December 23, 2009
ISSN 0028-1344

CONTENTS

G. Thomas Watters	A revision of the western Atlantic Ocean genera *Anna, Antillophos, Bailya, Caducifer, Monostiolum,* and *Parviphos,* with description of a new genus, *Diantiphos,* and notes on *Engina* and *Hesperisternia* (Gastropoda: Buccinidae: Pisaniinae) and *Cumia* (Colubrariidae)	225
Robert T. Dillon, Jr.	Empirical estimates of reproductive isolation among the *Physa* species of South Carolina (Gastropoda: Pulmonata: Basommatophora)	276
Amy R. Wethington **John Wise** **Robert T. Dillon, Jr.**	Genetic and morphological characterization of the Physidae of South Carolina (Gastropoda: Pulmonata: Basommatophora), with description of a new species	282
Gisele Orlandi Introíni **Alexandre Lobo da Cunha** **Mário Manuel da Silva Leite Sousa** **Shirlei M. Recco-Pimentel**	Spermatozoan ultrastructure and detection of nuclear acid phosphatase activity in spermatids of *Anomalocardia brasiliana* and *Tivela mactroides* (Bivalvia: Veneridae)	293
Francesco Criscione **Danilo Scuderi** **Francesco Paolo Patti**	Revising α-taxonomy in shelled gastropods: the case of *Rissoa panhormensis* Verduin, 1985 (Caenogastropoda: Rissoidae)	303
Omar Mejía **Edna Naranjo-García** **Oscar J. Polaco**	Three new species of *Humboldtiana* (Gastropoda: Pulmonata: Humboldtianidae) from Mexico	313
Research Note		
Jonathan R. Hendricks **Roger W. Portell** **Greta L. Polites**	An aberrant sinistral *Conus* (Neogastropoda: Conidae) from the Miocene of Florida, USA	317
Author Index		319

NOTICIARIO DE LA SOCIEDAD ESPAÑOLA DE MALACOLOGIA

(Espagne)
N°52, décembre 2009



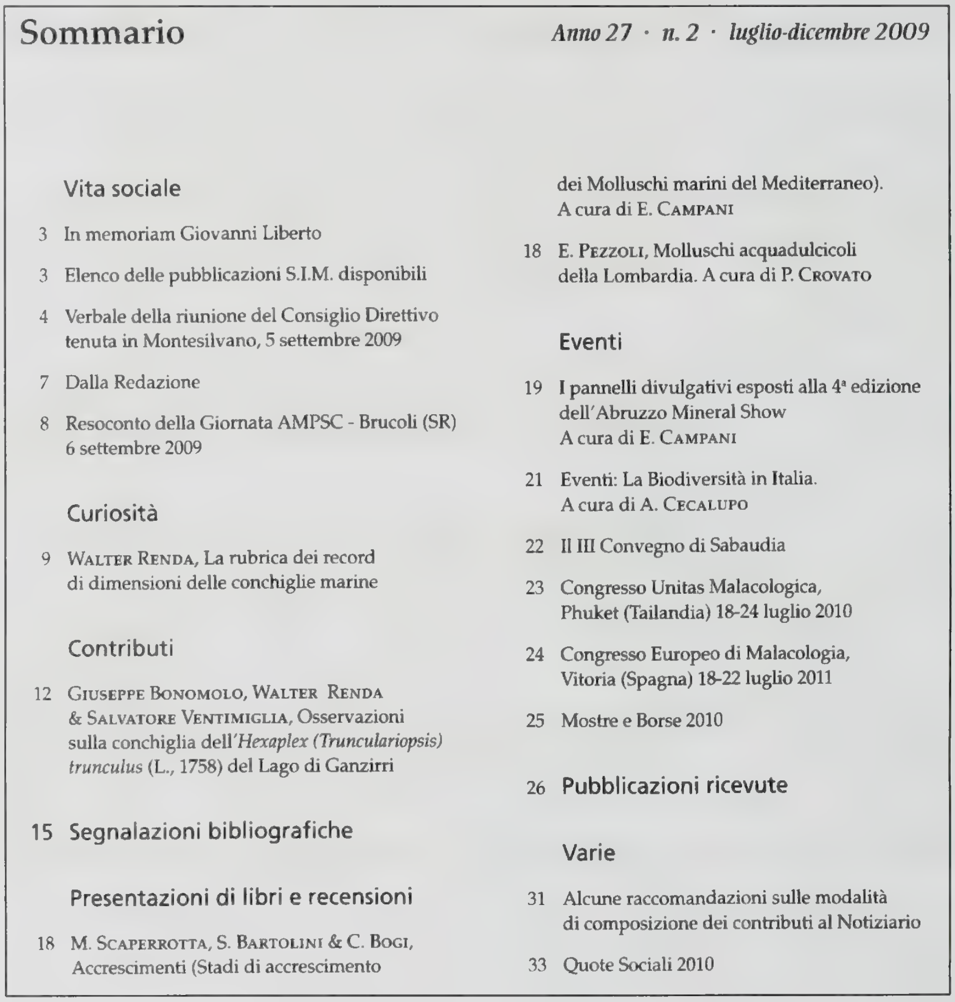
INDICE

Editorial … 3
Secretaría … 4
Tesorería … 5
Recensiones Bibliográficas … 9
Noticias Malacológicas … 12
Colaboraciones
- *Quickella arenaria* (Gastropoda: succineidae) living in the Cantabrian Mountains, NW Spain (Geraldine A. Holyoak & David T. Holyoak) … 26
- Nuevas citas de moluscos marinos para Canarias (Gastropoda, Neogastropoda y Pyramidellidae). 3 (Emilio Rolán & Francisco Déniz) … 28
- Materiais para o estudo da Malacofauna não-marinha de Portugal. 4. Revisão das espécies aquáticas introduzidas (Álvaro de Oliveira) … 31
- Primera cita de *Bursatella leachi* de Blainville, 1817 (Mollusca, Gastropoda, Aplysiidae) en la Península Ibérica (Luis Murillo & Francisco Javier Murcia) … 38
- *Plicopurpura pansa* (Gould, 1853) el "caracol púrpura o morado" en la Costa del Pacífico Mexicano: un recurso sobreexplotado (Zoila Graciela Castillo Rodríguez) … 39
- *Ferrissia fragilis* (Gastroda: Planorbidae) in Portugal (Geraldine A. Holyoak) … 41
- Nueva información sobre canibalismo en *Rhabdogulella bicolor* (Hutton, 1834) (Raúl Fernández-Garcés) … 42
- Sobre la presencia de *Ovatella (Ovatella) firminii (Payraudeau*, 1826) (Gastropoda, Elobiidae) en la comunidad valenciana (Alberto Martínez-Ortí & Fernando Robles) … 44
- Adiciones a la malacofauna marina de Cuba. II (Raúl Fernández-Garcés & Emilio Rolán) … 48
- Sobre la posición sistemática de *Teinostoma azorica* Dautzenberg & Fisher, 1896 (Federico Rubio & Emilio Rolán) … 55

Indice de Colaboraciones … 57
Las mejores fotos de nuestros socios … 65
Indices de Revistas … 66
Pasatiempos … 78

NOTIZIARIO S.I.M.

(Italie)
Vol. 27, N°2, juillet-décembre 2009



Sommario

Anno 27 · n. 2 · luglio-dicembre 2009

Vita sociale

3 In memoriam Giovanni Liberto

3 Elenco delle pubblicazioni S.I.M. disponibili

4 Verbale della riunione del Consiglio Direttivo tenuta in Montesilvano, 5 settembre 2009

7 Dalla Redazione

8 Resoconto della Giornata AMPSC - Brucoli (SR) 6 settembre 2009

Curiosità

9 WALTER RENDA, La rubrica dei record di dimensioni delle conchiglie marine

Contributi

12 GIUSEPPE BONOMOLO, WALTER RENDA & SALVATORE VENTIMIGLIA, Osservazioni sulla conchiglia dell'*Hexaplex (Trunculariopsis) trunculus* (L., 1758) del Lago di Ganzirri

15 Segnalazioni bibliografiche

Presentazioni di libri e recensioni

18 M. SCAPERROTTA, S. BARTOLINI & C. BOGI, Accrescimenti (Stadi di accrescimento dei Molluschi marini del Mediterraneo). A cura di E. CAMPANI

18 E. PEZZOLI, Molluschi acquadulcicoli della Lombardia. A cura di P. CROVATO

Eventi

19 I pannelli divulgativi esposti alla 4ª edizione dell'Abruzzo Mineral Show A cura di E. CAMPANI

21 Eventi: La Biodiversità in Italia. A cura di A. CECALUPO

22 Il III Convegno di Sabaudia

23 Congresso Unitas Malacologica, Phuket (Tailandia) 18-24 luglio 2010

24 Congresso Europeo di Malacologia, Vitoria (Spagna) 18-22 luglio 2011

25 Mostre e Borse 2010

26 Pubblicazioni ricevute

Varie

31 Alcune raccomandazioni sulle modalità di composizione dei contributi al Notiziario

33 Quote Sociali 2010

FERNAND & RIKA DE DONDER
Melsbroeksestraat 21
1800 Vilvoorde Peutie
BELGIUM
Tel : +32 (0)2 253 99 54
Fax : +32 (0)2 252 37 15
e-mail : fernand.de.donder@pandora.be

WORLDWIDE SPECIMEN SHELLS

10 Minutes from Brussels Airport. Visitors welcome.

All Families from the very common to the ultra rare, specialized in Pectinidae, Philippine shells and European shells.

Free list on request, good quality shells at the best prices. Satisfaction guaranteed !

American
CONCHOLOGIST

Calendar membership (Jan - Dec) = $25 (USA)
Postal surcharges: + $5 for USA first class,
Canada & Mexico + $5, other nations + $15
New members apply to Doris Underwood, Membership Director
698 Sheridan Woods Drive
W. Melbourne, FL 32904-3302
USA
dunderwood1@cfl.rr.com

Quarterly Journal of the Conchologists of America, Inc.

XENOPHORA
Bulletin de l'Association Française
de Conchyliologie

2003 Yearly Subscription Rate
France - Europe - DOM TOM : 45 €
Other countries : 55 €
Visit our site : www.xenophora.fr.st

afc BP 307 F-75770 Paris Cedex 16

SOCIEDAD ESPAÑOLA
DE MALACOLOGIA
S.E.M.

Museo Nacional de Ciencias Naturales
José Gutiérrez Abascal, 2
28006 MADRID

SEM (Sociedad Española de Malacologia) is a scientic society devoted to the study of molluscs.

Every year the memberships receive the following publications:

2 issues of IBERUS
1 issue of RESEÑAS MALACOLOGICAS
2-3 issues of NOTICIARIO DE LA SEM

some years, 1 extra IBERUS from a Congress or as supplement.

You can be membership of the SEM by 7.000 ptas by year, plus an unique inscription fee of 1.000 ptas.

Please, ask for the inscription print paper.

The Strandloper
BULLETIN OF THE CONCHOLOGICAL SOCIETY OF SOUTHERN AFRICA

The quarterly bulletin of the Conchological Society of Southern Africa contains reviews and discussion of Southern African marine and non-marine shells, and information about shell collecting in the region. Membership of the Society is US$25 per year.

Please contact
The Conchological Society of S.A.
7 Jan Booysen Str.
Annlin 0182 Pretoria
South Africa
or
email **mikec@msinfo.mintek.ac.za**

Nederlandse
Malacologische
Vereniging

Dutch
Malacological
Society

Our society warmly welcomes new members (both from the Netherlands and abroad) to participate in our activities:

- **the journals (Basteria and Correspondentieblad)**
- **the meetings (usually 3-4 per year)**
- **the Internet website**
- **the library**
- **the collecting excursions**

Join us and meet new shelling friends. Further info: Bram Breure, Van Schagenplantsoen 8, NL-2741 EN Waddinxveen, The Netherlands. E-mail: abreure@xs4all.nl

GLORIA MARIS

A magazine dedicated to the study of shells.

Edited by the Belgian Society for Conchology, organizers of the Belgium Shellshow

Subscription: Belgium: € 30 - The Netherlands: € 33
Other countries: € 40

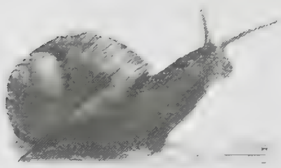
Members account manager: J. Wuyts Koningsarendlaan 82 B 2100 Belgium
tel.: 32 3 324 99 14 e-mail: wuyts.jean@ scarlet.be

TRITON

Journal of the Israel
Malacological Society

ISSN 1565-1916
Published twice a year since 2000
Yearly subscription rate 20 €

Further information:
Eduard Heiman
e-mail: heimel@netvision.net.il



Club Conchylia e.V.
German Shell Collector's Club

Our journals:

- Informationen
- Mitteilungen
- Acta Conchyliorum

Yearly subscription rate: 40.- €

Visit our site:

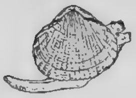
www.club-conchylia.de

Further informations:

Klaus Kittel
Sonnenrain 10
D-97859 Wiesthal
e-mail: klaus_kittel@hotmail.com

Si vous passez commande chez l'un de nos annonceurs, n'oubliez pas de préciser que vous avez trouvé son annonce dans Novapex/Société !!!

Keppel Bay Tidings
A quarterly magazine dedicated to the study of shells.
Edited by the Keppel Bay Shell Club Inc.
Subscription:- $20.00 Aus.
Apply to:- Keppel Bay Shell Club Inc.
P.O. Box 5166
Central Queensland Mail Centre, 4702
Queensland,Australia.



Grandes marées de l'année 2010

Christiane DELONGUEVILLE et Roland SCAILLET

Bonne nouvelle ! 2010 est un grand cru. Les plus grandes marées avec un coefficient de 116 auront lieu le 2 mars et le 10 septembre. Ne les ratez surtout pas ! D'autres marées de coefficient supérieur à 110 auront également lieu début février, fin mars, en octobre et même en pleines vacances à la mi-août. Bref de quoi satisfaire les amateurs de pêche à pied et d'observation de la faune de l'estran.

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Samedi 2	(99) - 101
	Dimanche 3	101 - 101
	Samedi 30	(97) - 103
	Dimanche 31	108 - 111
Février	Lundi 1	112 - 112
	Mardi 2	110 - 106
	Mercredi 3	101 - (94)
	Dimanche 28	102 - 108
Mars	Lundi 1	113 - 115
	Mardi 2	116 - 115
	Mercredi 3	113 - 108
	Jeudi 4	102 - (95)
	Lundi 29	101 - 106
	Mardi 30	110 - 112
	Mercredi 31	112 - 110
Avril	Jeudi 1	107 - 103
	Mercredi 28	(99) - 100
	Jeudi 29	100 - (99)
Mai	-	-
Juin	-	-
Juillet	Mardi 13	(98) - 101
	Mercredi 14	102 - 102
	Jeudi 15	100 - (98)
Août	Mardi 10	(98) - 103
	Mercredi 11	108 - 111
	Jeudi 12	112 - 111
	Vendredi 13	109 - 105
	Samedi 14	100 - (93)
Septembre	Mercredi 8	103 - 109
	Jeudi 9	113 - 115
	Vendredi 10	116 - 114
	Samedi 11	111- 106
Octobre	Jeudi 7	103 - 108
	Vendredi 8	111 - 112
	Samedi 9	111 - 109
	Dimanche 10	106 - 100
Novembre	Samedi 6	101 - 101
	Dimanche 7	101 - (99)
Décembre	-	-

Nous réitérons les conseils habituels : Remettez toujours les pierres déplacées en bon ordre. Observez, photographiez et n'échantillonnez que le strict nécessaire. Soyez prudents et renseignez-vous sur les heures des marées à l'endroit où vous vous trouvez. Bonnes marées !

REFERENCE :

Annuaire des Marées pour l'année 2010 - Ports de France - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Paris - 257 p.*

Pointe de l'Arcouest (Côtes d'Armor)

Les données reprises dans cet article peuvent également se retrouver sur notre site Internet :

http://users.swing.be/sw216502/

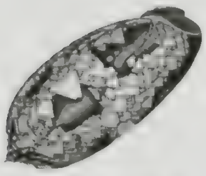
NOVAPEX / Société

SOMMAIRE

C. Vilvens	Prochaines activités	80
C. Delongueville & R. Scaillet	Escapade à Gorishoek (Zélande) - Pays-Bas	83
E. Meuleman	La journée des 1000 espèces à Ploegsteert (29 et 30 mai 2010)	88
C. Vilvens	L'écho des réunions : - Roland Houart : Les Muricidae – the continuing story	90
R.&J. Senders	Un record du monde pour *Cassis rufa*	91
C. Vilvens	Quoi de neuf ?	92
R.Houart, R. Scaillet & C. Vilvens	Quelques nouvelles publications	93
E. Meuleman	Nous avons reçu	98
C. Delongueville & R. Scaillet	Les marées de 2010	114

VIE DE LA SOCIETE

LIFE OF THE SOCIETY



Prochaines activités de la SBM

Claude VILVENS

__Lieu de réunion__ : **Nouveau local ! A partir de 14h**.

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

***

SAMEDI 23 OCTOBRE 2010

C. Delongueville & R. Scaillet : Le Svalbard

Cet archipel, situé dans la Mer de Barents à quelques 1000 km du Pôle Nord, est fait de paysages de banquise, de toundra, de glaciers et de montagnes. En voyageant dans ce désert blanc nous illustrerons la faune et la flore si particulière de ces îles lointaines et bien entendu les mollusques occuperont une place de choix dans cet exposé.

-- PUIS : La tradition du banquet sera aussi respectée en tant qu'événement gastronomique attendu : nous vous proposons en effet de nous retrouver au traditionnel

banquet annuel de la SBM

qui débutera à 19h (voir annonce ci-dessous).

***

SAMEDI 20 NOVEMBRE 2010

Tout le monde : L'EXPOSITION ANNUELLE DE LA SBM.

Eh oui, le rendez-vous rituel de l'exposition de coquillages par les membres de la Société a été déplacé dans le temps (de janvier, on passe à novembre), afin de ne pas risquer de devoir affronter des conditions climatiques trop mauvaises (neige, verglas, brouillard - brrr en voiture).

Egalement à noter : comme notre salle habituelle (la salle Memling) est un peu petite pour cette manifestation, nous occuperons la **salle Brueghel** au même étage de notre adresse habituelle de réunion.

Pour le reste, rien n'a changé : cette exposition est l'occasion pour chacun de montrer l'un ou l'autre aspect de la malacologie qui lui tient à cœur. Aucune condition particulière n'est requise et tout le monde est cordialement invité à participer et aussi, bien sûr, à venir admirer quelques spécimens qui font la fierté de la collection de nos membres !

***

SAMEDI 11 DECEMBRE 2010

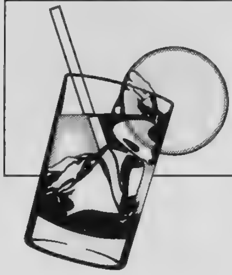
A. Langleit: Les Macominae

Notre spécialiste des Tellinidae continue à nous brosser un panorama de l'état de la systématique de cette belle famille. Cette fois, elle nous emmène dans la sous-famille des Macominae (le genre *Macoma*, bien sûr, mais d'autres aussi comme *Gastrana*).

***

*Tirant expérience de la réunion annulée en janvier 2010 pour cause de mauvaises conditions climatiques, **la SBM fera relâche en janvier 2011**. Mais réservez déjà dans vos agendas le **5/2/2011** et le **19/3/2011** (Assemblée générale).*

***

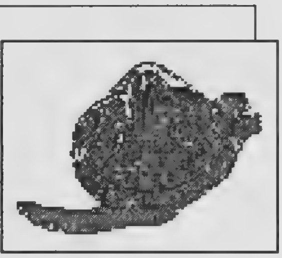


Banquet de la Société Belge de Malacologie

le samedi 23 octobre 2010 à 19h

au restaurant :

Le Rustique

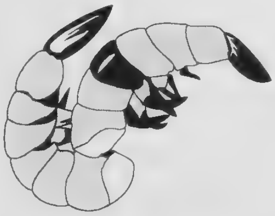


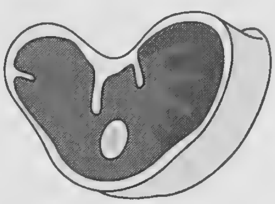
Avenue du Cimetière de Bruxelles, 155
1140 Evere

Comme d'habitude, les menus détaillés ne nous sont pas encore connus, étant donné qu'ils changent chaque mois. Cependant, le menu comprendra dans sa globalité :

- l'apéro et ½ bouteille de vin (blanc ou rouge);
- une entrée parmi 3 propositions;
- un plat principal parmi 3 propositions;
- dessert + café.

Extra à payer individuellement en supplément.





Prix : 35,00 €

Il est impératif de réserver afin que le restaurateur puisse nous réserver le meilleur accueil

Comment réserver ?

Pour le 13 octobre 2010, au plus tard, il convient de virer la somme correspondant au nombre de menus réservés au compte BBL : **310-1142433 – 53** de
Madame **Annie Langleit**, avenue Cicéron, 27/92 à 1140 – Bruxelles,
(pas de paiement à la SBM, s'il vous plaît !)

Nous nous réjouissons de vous rencontrer lors de cette joyeuse réunion !

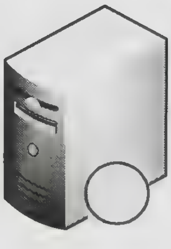
Bonnes vacances à tous !!!

Pour les informations de dernière minute :

Sur Internet :

une nouvelle adresse !

http://www.societe-belge-de-malacologie.be/



Novapex/Société : la publication généraliste de la SBM

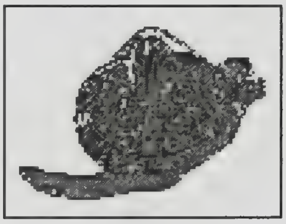
Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

Afin de faciliter le travail de la Rédaction, il est vivement (et le mot est faible ;-)) souhaité de respecter les règles suivantes pour les articles proposés :

- document MS-Word (pour PC Windows 2000 ou XP);
- police de caractères Times New Roman;
- texte de taille 10, titres de taille 12;
- interligne simple;
- toutes les marges à 2,5 cm;
- document en une seule section;
- pas de mode colonne;
- photos en version électronique JPG.

Merci pour les Scribes ;-) ! N'hésitez pas à demander une page avec en-tête pour cadrer au mieux vos travaux (vilvens.claude@skynet.be ou e.meuleman@skynet.be).



Escapade à Gorishoek (Zélande) - Pays-Bas

Christiane DELONGUEVILLE
Avenue Den Doorn, 5 – B - 1180 Bruxelles - christiane.delongueville@skynet.be

Roland SCAILLET
Avenue Franz Guillaume, 63 – B - 1140 Bruxelles - scaillet.roland@skynet.be

INTRODUCTION

Suite à la lecture de deux articles (Faasse & Ligthart, 2007 et 2009) concernant la présence de Muricidae invasifs dans l'Oosterschelde (Pays-Bas), l'idée nous est venue de profiter d'une grande marée, le 12 août dernier, pour y faire un échantillonnage. Nous avons pris la direction de Gorishoek sur l'île de Tholen en Zélande. L'itinéraire pour rejoindre l'endroit nous avait été renseigné par la consultation d'un site web consacré à la plongée sous-marine dans cette région. Il indiquait de rejoindre un établissement nommé « de Zeester ».
Aussitôt dit, aussitôt fait. 1 heure et 15 minutes après avoir quitté Bruxelles, nous voici à pied d'œuvre au bout d'une petite route qui conduit à l'unique bâtiment (« de Zeester ») faisant face à l'embarcadère du bac effectuant la liaison Yerseke - Gorishoek (piétons et cyclistes uniquement). Face à nous, la digue se prolonge par une large jetée (Fig. 2). Décision à prendre : faisons nous la marée à gauche ou à droite de la jetée? La partie gauche étant déjà bien dégagée (Fig. 1 et 3) et laissant voir quelques affleurements rocailleux, nous avons décidé d'explorer cette zone. Observé de plus près, le sol est couvert de petits récifs fait d'amas de *Crassostrea gigas* (Thunberg, 1793) et plus loin de blocs rocheux également couverts d'huîtres. Ce n'est qu'arrivé à la partie basse de l'estran, en retournant les pierres, que les premiers spécimens des gastéropodes recherchés ont été trouvés.

MATÉRIEL RÉCOLTÉ (Fig. 9)

Urosalpinx cinerea (Say, 1822) : De nombreux spécimens accompagnés de leurs pontes sont présents sous les rochers et ont été récoltés au plus bas de la marée (Fig. 4-7, 11, 21-23).

Ocinebrellus inornatus (Récluz, 1851) : L'espèce est beaucoup moins abondante que la précédente ; un seul spécimen adulte et 9 juvéniles ont été trouvés sous les rochers dans un périmètre limité (Fig. 8, 10, 13-17).

Parmi les autres mollusques récoltés lors de l'échantillonnage, deux autres invasifs d'introduction moins récente : *Mercenaria mercenaria* (Linnaeus, 1758) - 1 spécimen vide - et *Ruditapes philippinarum* (Adams & Reeve, 1850) - spécimens vivants - ont été trouvés dans la même zone au bas de la marée.

Quant à la faune locale, elle était représentée, entre autres, par *Nucella lapillus* (Linnaeus, 1758) (Fig. 12, 19-20), *Patella vulgata* Linnaeus, 1758, *Gibbula cineraria* (Linnaeus, 1758), *Littorina littorea* (Linnaeus, 1758), *Mytilus edulis* Linnaeus, 1758 et *Lepidochitona cinerea* (Linnaeus, 1767) (Fig. 18).

Comme il s'agissait d'une marée à fort coefficient, le dessous des rochers observés au plus bas de l'estran était abondamment colonisé par des ascidies, des éponges et d'autres invertébrés.

RÉFÉRENCES

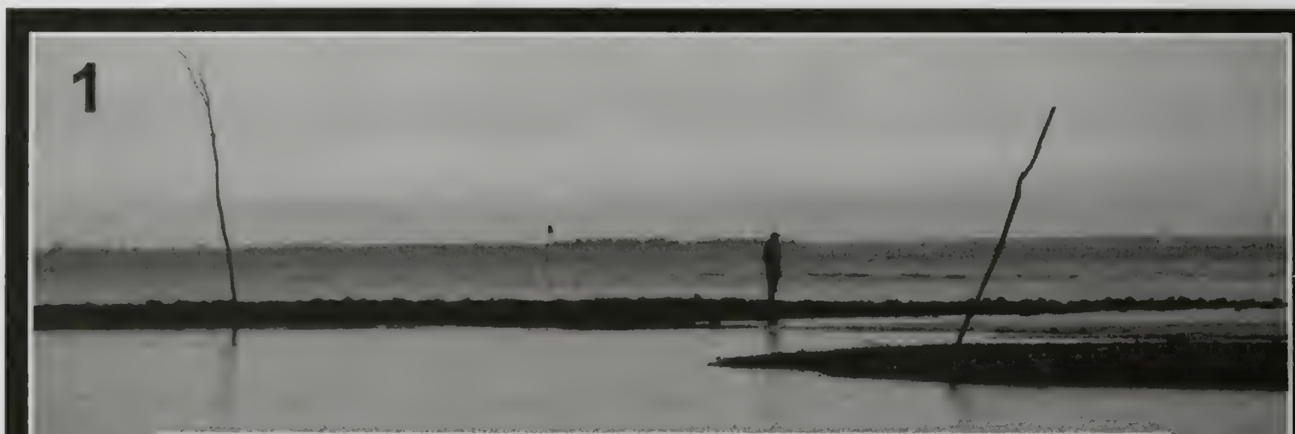
Faasse, M. & Ligthart, M. 2007. The American Oyster Drill, *Urosalpinx cinerea* (Say, 1822), Introduced to The Netherlands - Increased Risks after Ban on TBT? *Aquatic Invasions*; 2(4):402-406.

Faasse, M. & Ligthart, M. 2009. American (*Urosalpinx cinerea*) and Japanese Oyster Drill (*Ocinebrellus inornatus*) (Gastropoda: Muricidae) Flourish near Shellfish Culture Plots in The Netherlands. *Aquatic Invasions*; 4(2):321-326.

LÉGENDES :

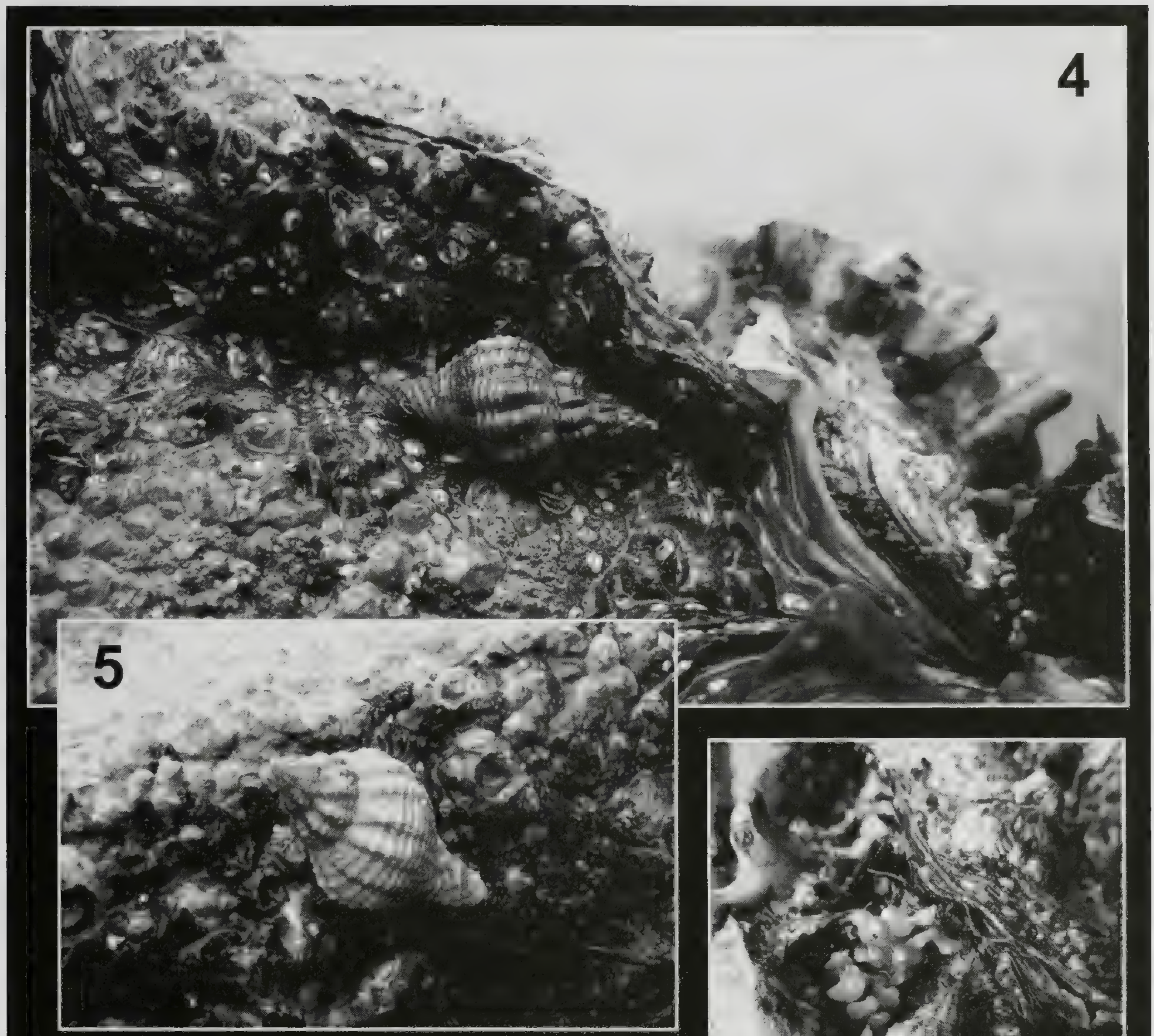
Fig. 1 à 3	Gorishoek
Fig. 4 à 7	*Urosalpinx cinerea* - in situ
Fig. 8 et 10	*Ocinebrellus inornatus* - juvéniles in situ
Fig. 9	Une heure de récolte ...
Fig. 11	*Urosalpinx cinerea* - ponte in situ
Fig. 12	*Nucella lapillus* - in situ
Fig. 13 à 15	*O. inornatus* (juvénile) - 27,4 x 16,6 mm
Fig. 16 et 17	*O. inornatus* (adulte) - 43,5 x 25,7 mm
Fig. 18	*Lepidochitona cinerea* - 19,1 x 12,2 mm
Fig. 19 et 20	*N. lapillus* - 38,3 x 22,7 mm
Fig. 21 et 22	*U. cinerea* - 24,9 x 13,0 mm
Fig. 23	*U. cinerea* - ponte sur *Crassostrea gigas* - 45,9 x 34,6 mm

----

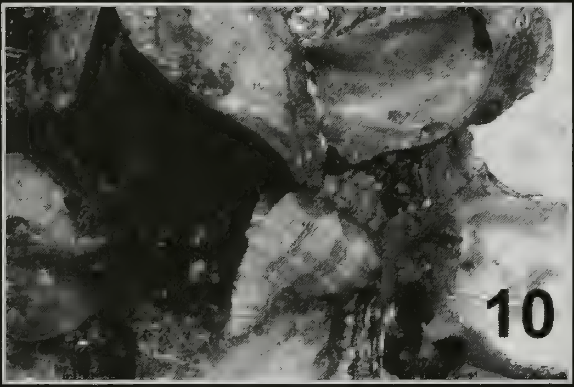

1

2

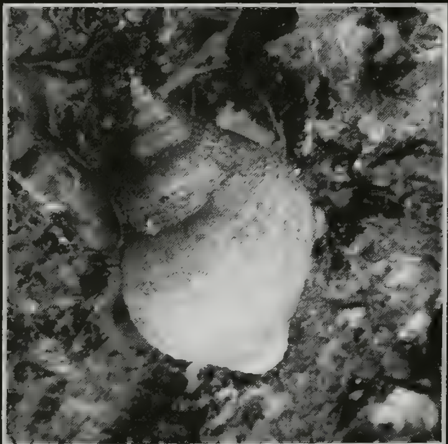
3

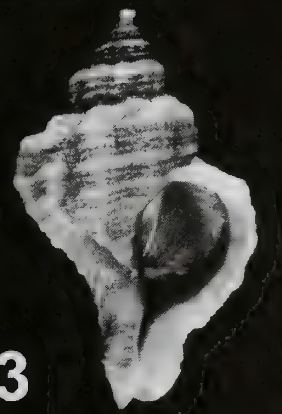

4
5
6
7
8

9

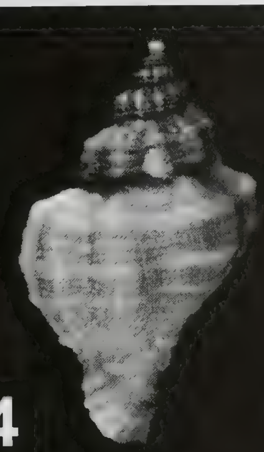

10

11

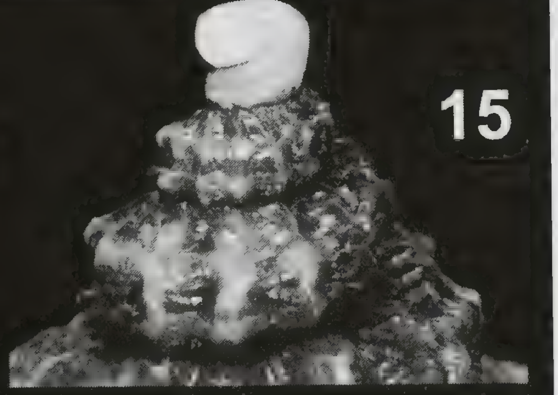

12



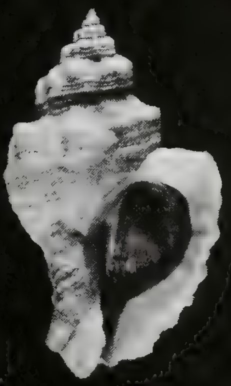
13



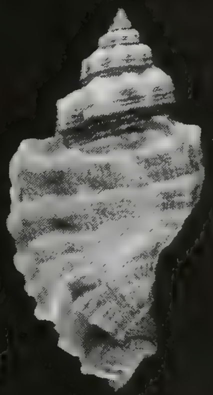
14



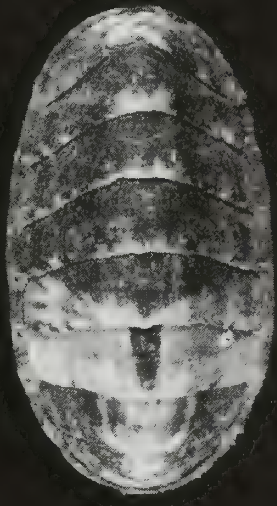
15



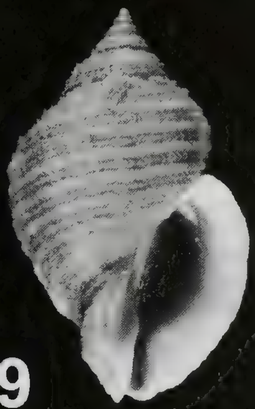
16



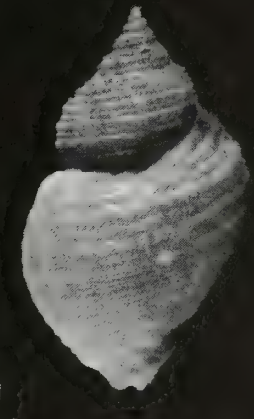
17



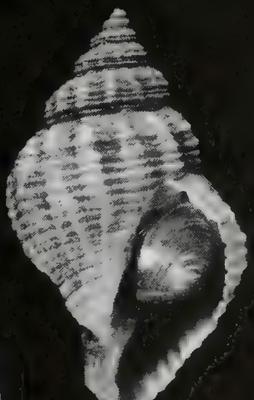
18



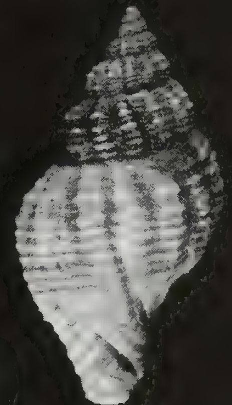
19



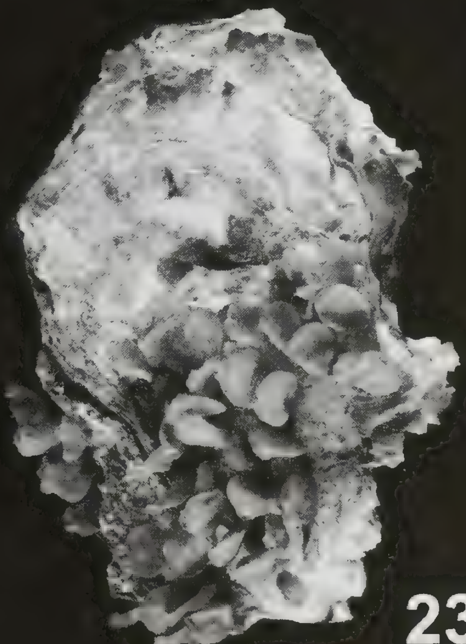
20



21



22



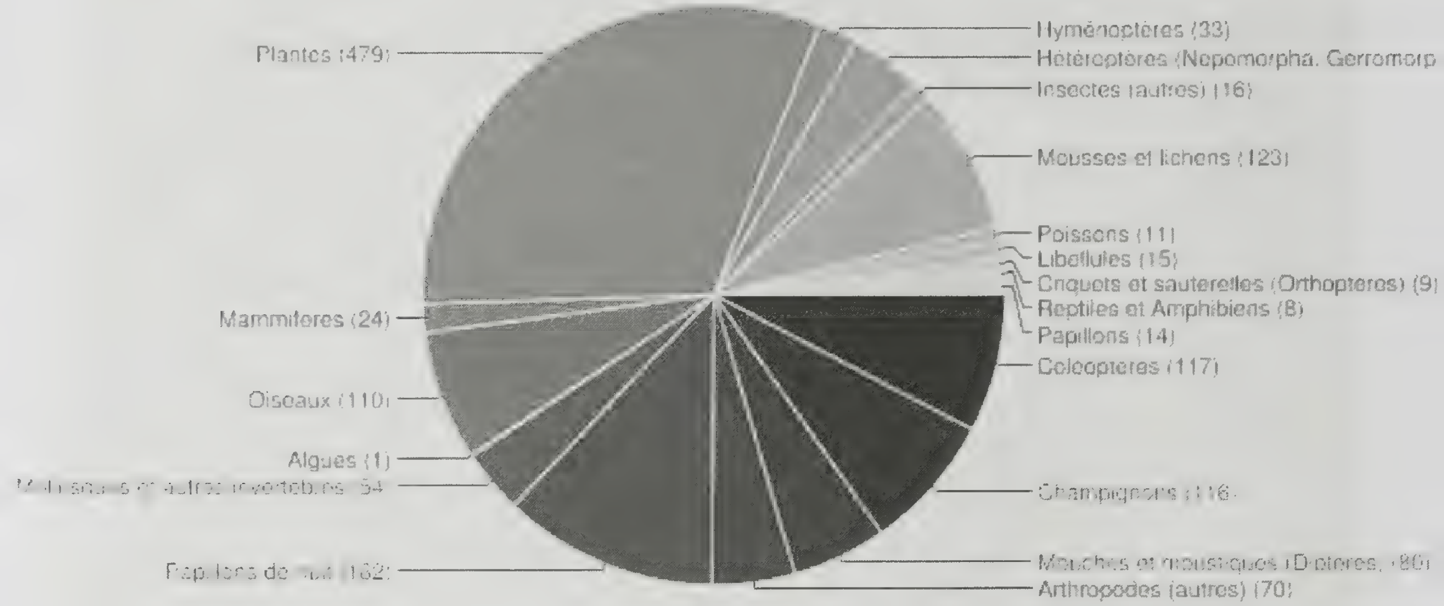
23

La journée des 1000 espèces à Ploegsteert (29 et 30 mai 2010)

Etienne MEULEMAN

C'est dans une ambiance bonne enfant que s'est déroulée la journée des 1000 espèces à Ploegsteert. En effet, dans le cadre d'un projet Interreg IV et s'inscrivant dans le cadre de l'année internationale de la biodiversité, la journée des 1000 espèces a marqué le point de départ d'un projet BIPS (biodiversité urbaine). Le but de cette journée était de rassembler des scientifiques de tout bord pour observer, identifier et recenser un maximum d'espèces (flore et faune) de quatre sites de l'Eurométropole. La société belge de malacologie était représentée pour identifier… des mollusques (eh oui !).

Sur les quatre sites de récolte (Harelbeke/Deerlijk, Ieper, Ploegsteert et les Prés du Hem en France) plus de 1500 espèces ont été répertoriées. Vous trouverez ci-dessous les résultats de ces récoltes.



(Graphique extrait du site http://observations.be)

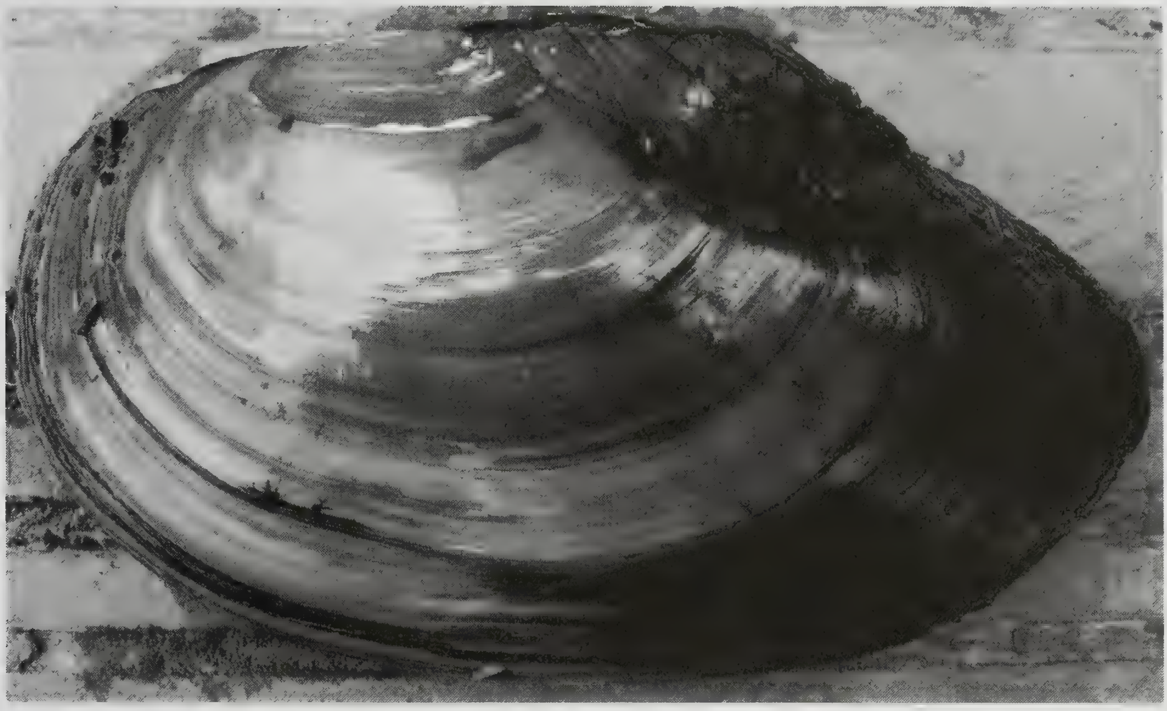
On remarque sur le graphique que 54 espèces de mollusques et autres invertébrés ont été trouvées.

Voici la liste des espèces récoltées pour les mollusques :

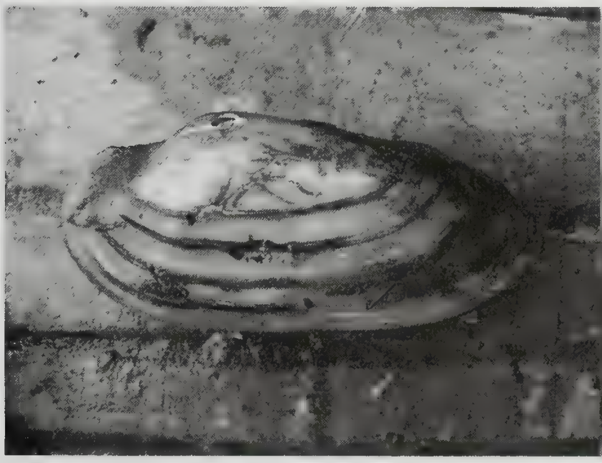
Cepaea nemoralis (Linné, 1758)
Discus rotundatus (Müller, 1774)
Trichia hispida (Linné, 1758)
Arion rufus (Linné, 1758)
Succinea putris (Linné, 1758)
Cohlicopa lubrica (Müller, 1774)
Aegopinella nitidula (Draparnaud, 1805)
Radix ovata (Draparnaud, 1805)
Arion subfuscus (Draparnaud, 1805)
Dreissena polymorpha (Pallas, 1771)
Unio pictorum (Linné, 1758)
Acroloxus lacustris (Linné, 1758)
Aegopinella pura (Alder, 1830)
Anodonta cygnea (Linné, 1758)
Arion intermedius Normand, 1852
Hippeutis complanatus (Linné, 1758)
Pisidium henslowanum (Sheppard)
Potamopyrgus antipodarum
Stagnicola palustris (Müller, 1774)
Pisidium spec

Ci-dessous quelques photos (de Claude Vilvens) de cette belle journée au grand air.

Cepaea nemoralis



Anodonta cygnea



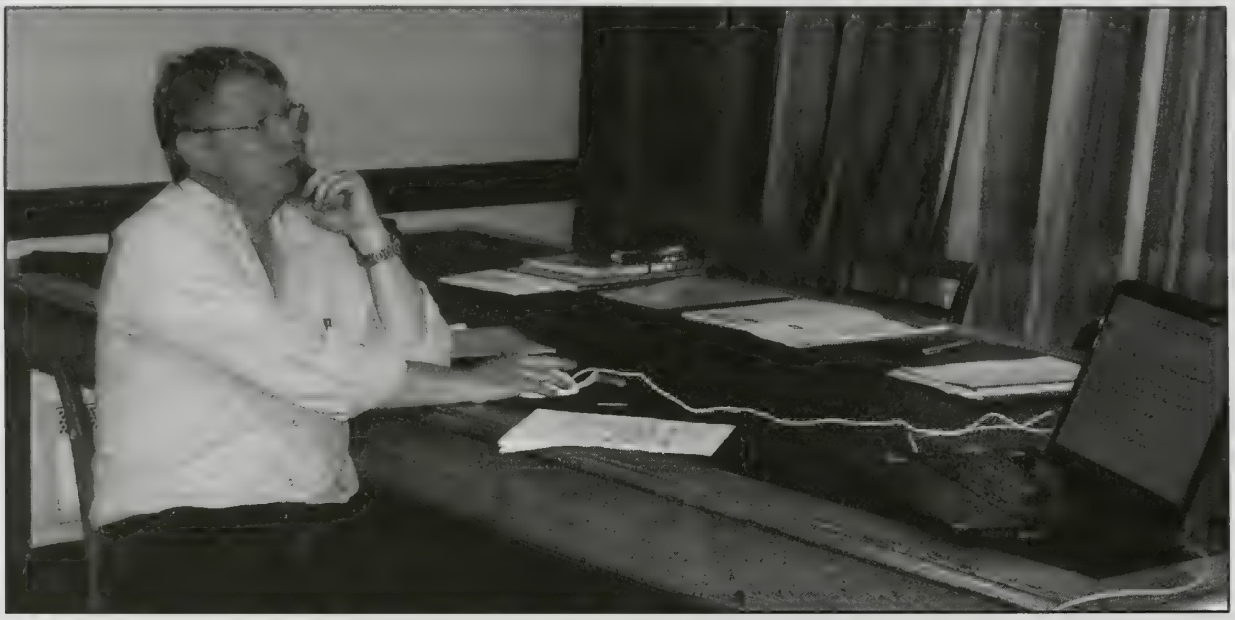
Union pictorum

Succinea putris

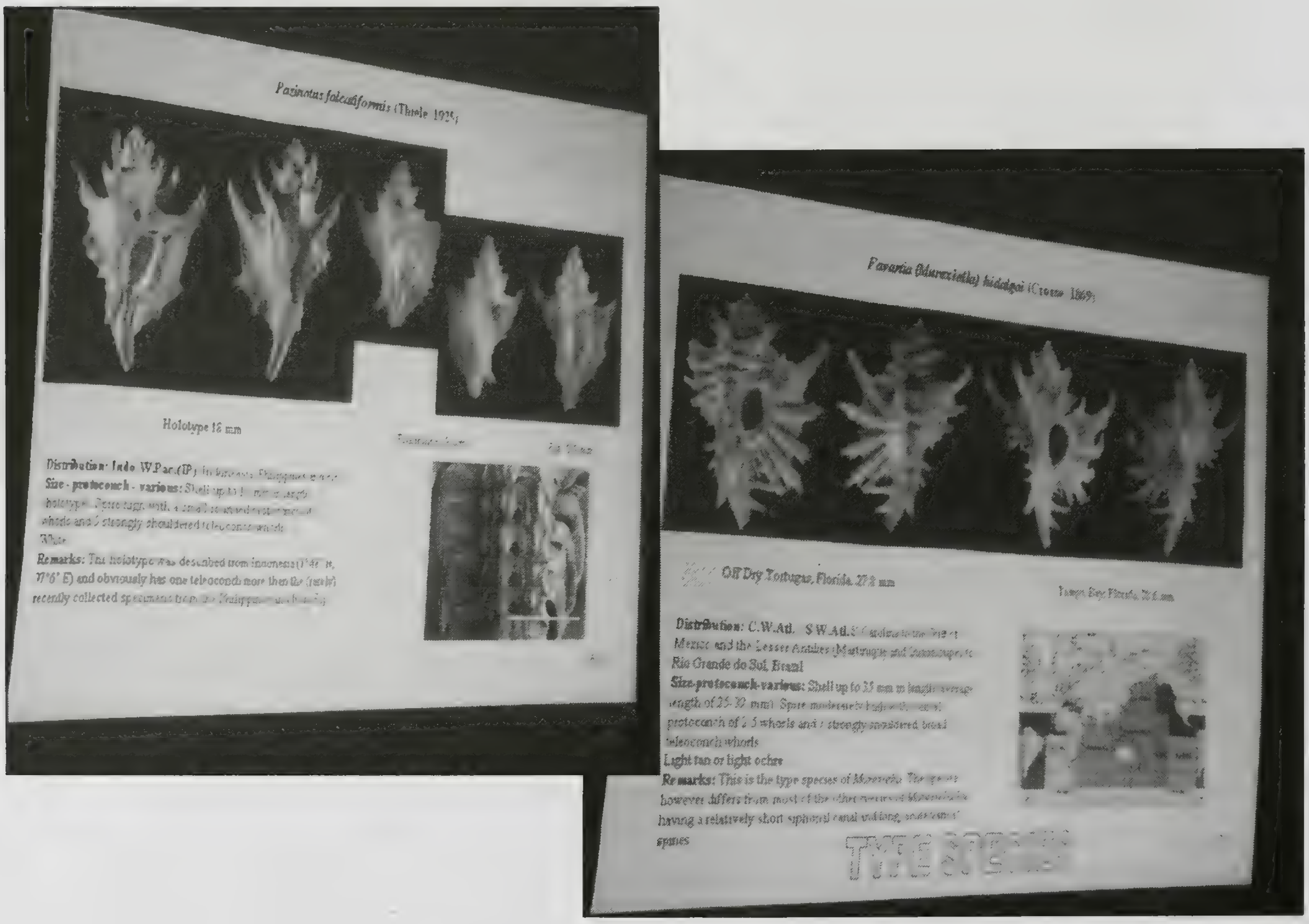
L'écho des réunions

Claude VILVENS

Réunion du 19 juin 2010 (CV) → **Roland Houart : Les Muricidae – the continuing story**



Notre spécialiste de cette splendide et épineuse famille des Muricidae nous a donc emmené dans les méandres de la systématique de la sous-famille des Muricopsinae avec la suite attendue, soit les genres *Murexiella* et *Pygmaepterys*. Comme d'habitude (ai-je envie de dire ;-)), l'exposé fut de niveau professionnel avec description, iconographie, synonymes, radulas, anecdotes et remarques diverses ☺. Nous attendions de belles coquilles et explications claires : nous n'avons pas été déçus.



Pazinotus falcatiformis (Thiele 1925)

Holotype 18 mm

Distribution: Indo W.Pac.(IP) [illegible]

Size - protoconch - various: [illegible]

White

Remarks: The holotype was described from Indonesia [illegible] E) and obviously has one teleoconch more then the [illegible] recently collected specimens [illegible]

Favartia (Murexiella) hidalgoi (Crosse 1869)

Off Dry Tortugas, Florida, 27.8 mm

[illegible] Florida, [illegible] mm

Distribution: C.W.Atl. – S.W.Atl. [illegible] Mexico and the Lesser Antilles [illegible] Rio Grande do Sul, Brazil

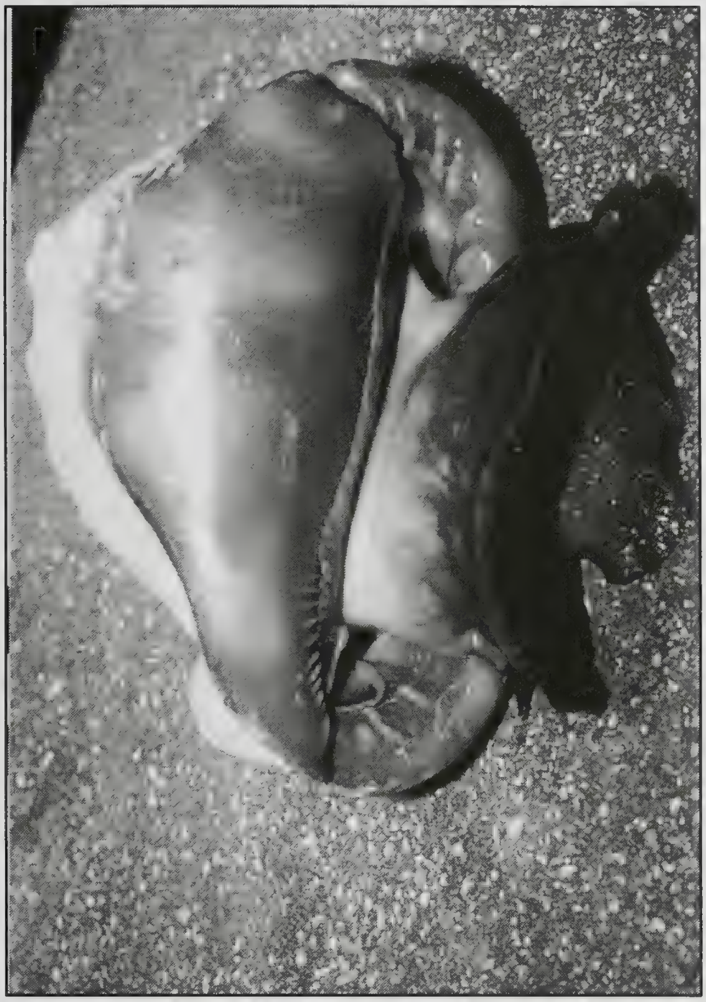
Size-protoconch-various: Shell up to 35 mm in length [illegible] length of 25-30 mm) [illegible] protoconch of [illegible] whorls and [illegible] strongly shouldered, broad teleoconch whorls

Light tan or light ochre

Remarks: This is the type species of *Murexiella*. [illegible] however differs from most of the other [illegible] having a relatively short siphonal canal [illegible] spines

Un record du monde pour *Cassis rufa*

Rita et Jacques SENDERS

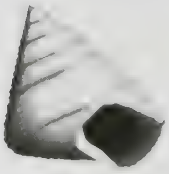


Lors de notre dixième séjour à Bali, nous avons rejoint l'île de Lembogan sur la côte Sud-Est. L'ambiance y est très décontractée : pas de voitures, pas beaucoup d'estivants à part quelques plongeurs à la recherche de beaux spots sous-marins. Les habitants peu nombreux, groupés dans deux villages et vivent principalement de la culture des algues marines. Quelques petits promontoires de piquets en bois, fichés dans le sable pour ralentir l'érosion, créent de petites cuvettes où l'eau stagne à marée basse.

Lors d'une petite promenade nous avons eu l'attention attirée par un petit monticule de sable à quelques mètres du rivage. Ce monticule restait visible entre deux vagues. En creusant légèrement nous avons eu la surprise de découvrir un gros *cassis rufa* qui nous a semblé énorme. Nous l'avons rincé à l'eau courante avant de le photographier. Le dos de ce coquillage était fort abîmé et recouvert en partie de diverses concrétions calcaires. Après l'avoir photographié nous l'avons mesuré:
209,2 mm.

Nous l'avons remis à l'eau à la place où nous l'avions trouvé. L'animal s'est très vite enfoui à nouveau dans le sable. Le lendemain l'animal se trouvait toujours au même endroit, plus ou moins enfoui. Nous n'avions emporté aucun produit pour conserver l'animal. C'est donc sans regret que nous l'avons laissé dans son environnement habituel.

A notre retour en Europe nous avons signalé notre découverte à plusieurs marchands qui nous ont confirmé que sa grandeur était exceptionnelle, le record du monde de 197 mm était largement battu. C'était un beau souvenir de plus que nous rapportions de ce beau pays qui nous a littéralement envoûtés.



Quoi de neuf ?

Claude VILVENS

Spanish Malacological Society
University of the Basque Country
Spanish National Research Council

6TH CONGRESS OF THE EUROPEAN MALACOLOGICAL SOCIETIES (CEMS)

Vitoria-Gasteiz, Spain
18-22 July 2011

First circular: June, 2010

The Congress will be held on the Campus of Álava of the University of the Basque Country.
Updated information will be available at the Congress website http://www.euromalacol2011.eu

---

Paul le Poulpe

La coupe du monde de football a, entre autres, servi à mettre sur le devant de la scène un mollusque : Paul le poulpe ou Paul la pieuvre (Krake Paul), un sympathique céphalopode doté, semble-t-il, de pouvoirs de prédiction : on l'appelle aussi "Paul le devin". Il restera en effet célèbre pour ses pronostics (tous corrects) concernant les matchs de l'équipe d'Allemagne de football et aussi pour la finale Espagne/Pays-Bas.
Britannique d'origine (aquarium Sea Life de Weymouth), Paul vit à l'aquarium d'Oberhausen en Allemagne, méritant le titre d' "oracle d'Oberhausen" ;-). Sa méthode : il choisit l'un des deux récipients contenant une moule, récipient marqué aux couleurs d'un pays. Ainsi fait-il connaître son choix …

Quelques nouvelles publications

Roland HOUART, Roland SCAILLET & Claude VILVENS

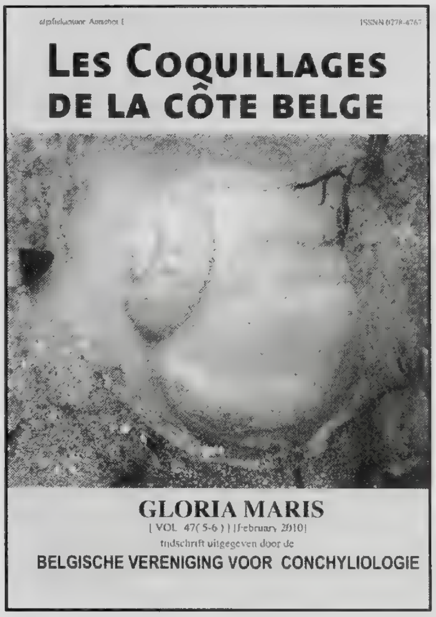
Voici, coup sur coup, deux nouvelles publications sur les mollusques de la côte belge.

LES COQUILLAGES DE LA CÔTE BELGE

Gloria Maris

pp. 3-67, 11 planches couleurs
Prix: 18 euros + frais d'envoi.

Commande: M. Jean Wuyts: wuyts.jean@scarlet.be



LES COQUILLAGES
DE LA CÔTE BELGE

GLORIA MARIS
[VOL 47(5-6)] [February 2010]
tijdschrift uitgegeven door de
BELGISCHE VERENIGING VOOR CONCHYLIOLOGIE

Edité par nos collègues flamands de la BVC (Belgische Vereniging voor Conchyliologie), c'est en réalité le volume 47 (5-6) daté du 20 février 2010 de leur publication trimestrielle "Gloria Maris".
L'auteur, Nathal Severijns, est un spécialiste des mollusques de Belgique. On se souvient notamment de sa conférence chez nous qui nous a permis d'y voir beaucoup plus clair dans les Solenidae et autres *Ensis* de la côte belge.
Chaque espèce est décrite et accompagnée de notes traitant de l'habitat, du mode alimentaire et d'autres particularités. Les photos sont excellentes et permettent une bonne identification des espèces.
Cette brochure est éditée en néerlandais et en français.

***

SCHELPEN AAN DE BELGISCHE KUST

par **Koen Fraussen et Stefaan Wera**

pp. 1-142, tout en couleur
Prix: 20 euros + frais d'envoi (en néerlandais uniquement)

Ed. Lannoo Campus, Tielt 2010

Koen Fraussen & Stefaan Wera
SCHELPEN
AAN DE BELGISCHE KUST
WEET WAT JE VINDT
OP HET STRAND
NATUURGIDS
LANNOO CAMPUS

Nous connaissons tous notre ami Koen Fraussen, le spécialiste de renommée internationale des Buccinidae et autres *Neptunea*... Mais ce que nous savions moins c'est que la fibre malacologique nationale vibre également en lui ! En feuilletant ce livre nous nous apercevons que c'est un spécialiste en la matière qui a rédigé ce texte, aidé en cela par Stefaan Wera, un biologiste, auteur déjà de quelques publications scientifiques populaires.
Schelpen aan de Belgische kust est un guide nature très pratique qui aidera le naturaliste dans la détermination des coquillages trouvés le long de nos plages. Aidé par les très bonnes photographies couleurs, tout amateur pourra ainsi différencier les espèces de notre littoral.
Les auteurs illustrent également des coquilles endommagées, telle que trouvées quelque fois sur le sable, et nous montrent, par l'image, plusieurs biotopes de la côte belge.
Ce livre vous permettra aussi d'identifier d'autres organismes marins tels les bernacles, anatifes et autres oursins. Des fossiles du Pléistocène quelquefois dispersés sur nos plages sont également illustrés.

J'en oubliais presque l'introduction très étoffée qui nous enseigne l'art de la récolte, de la conservation et également du respect de la nature et de sa biodiversité. Les auteurs nous fournissent aussi quelques adresses utiles en Belgique (groupes naturalistes, sociétés malacologiques et musées ou instituts ayant l'observation et la protection de la vie marine dans leurs attributions).

***

Pourr appel, si vous désirez un aperçu COMPLET des mollusques de Belgique c'est le moment ! Si vous n'avez pas encore les 5 volumes édité par la SBM et traitant des **mollusques terrestres et dulcicoles de Belgique,** commandez-les (29,60 euros + frais d'envoi chez Etienne Meuleman: etienne.meuleman@skynet.be), et joignez-y le plaisir d'y ajouter le présent ouvrage.
La faune malacologique de Belgique sera ainsi au grand complet dans votre bibliothèque. Nec plus ultra, vu le prix attractif de ces publications éditées par la BVC et la SBM, commandez-en deux jeux, un pour votre bibliothèque et l'autre pour le travail sur le terrain.

***

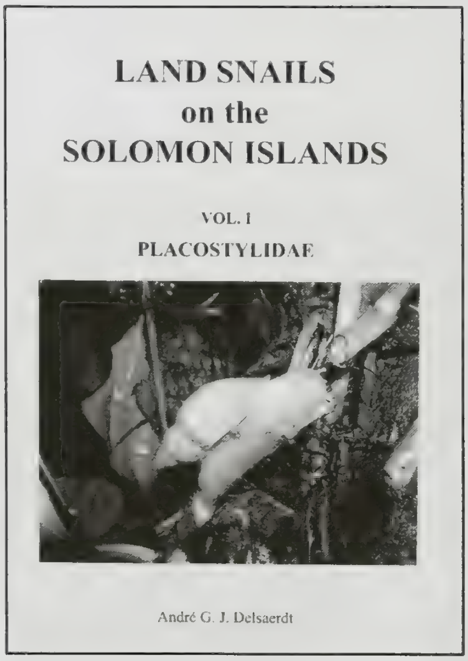
Voilà toute une série de publications peu expansives qui vous fourniront ont une aide précieuse pour vos prochaines excursions ou vacances à la côte belge et dans d'autres régions du pays.

Roland Houart

LAND SNAILS OF THE SOLOMON ISLANDS
Vol. I. Placostylidae
par André DELSAERDT

pp. 1-132, 14 planches couleurs + nombreuses photos noir et blanc.
Format 215 X 300 mm, couverture rigide.
Prix: 60 euros + frais d'envoi

Ed: L'Informatore Piceno, Ancona, Italie.
e-mail: malacologia@fastnet.it
http:/www.malacologia.it



LAND SNAILS
on the
SOLOMON ISLANDS

VOL. I
PLACOSTYLIDAE

André G. J. Delsaerdt

Cette importante contribution à la connaissance des gastéropodes terrestres des Iles Salomon est écrite par André Delsaerdt, ancien président et président de la BVC. L'auteur a séjourné plusieurs fois aux Iles Salomon et y a créé des liens d'amitié avec de nombreuses personnes qui l'ont notamment aidés dans le cadre de la collecte de spécimens. Le résultat de ses récoltes, additionné d'autres spécimens provenant de divers musées a donné naissance à ce premier volume dédicacé à la connaissance de la très belle famille des Placostylidae. L'auteur illustre les nombreuses espèces mais décrit également une nouvelle espèce et une nouvelle sous-espèce, donne aussi un nouveau nom et désigne de nombreux lectotypes et localités types. Après un hommage rendu à deux collaborateurs maintenant malheureusement disparu et un résumé des nouvelles descriptions et désignations, le préface nous fait découvrir quelques informations primordiales sur l'endémisme des espèces, leur variabilité et leur morphologie avec quelques illustrations de la coquille et de détails de la sculpture. L'auteur lui-même nous est présenté, avant les remerciements dédiés aux nombreuses personnes rencontrées sur place et aux nombreux collaborateurs qui ont permis la publication de cet ouvrage.
L'introduction nous situe la région géographique étudiée, son historique et la chronologie des différentes expéditions auxquels l'auteur a participé. La classification des Placostylidae nous est révélée sur 6 pages. L'auteur reconnaît quatre genres aux Iles Salomon: Aspastus Albers, 1850, Eumecostylus Martens, 1860, Placocharis Pilsbry, 1900 et Santacharis Iredale, 1927.
La partie systématique étudie chaque espèce en reprenant le genre, l'espèce, l'auteur et la date de description, le matériel type, la liste du matériel étudié, l'étymologie, les caractéristiques de la coquille, une discussion détaillée sur la synonymie, la classification et la variabilité de la coquille, et la distribution géographique. Le texte est agrémenté de figure comparant souvent la figure de la description originale avec le lectotype.

Le livre se termine par un chapitre sur l'origine et la dispersion des Placostylidae aux Iles Salomon, par un aperçu des différents lieux cités dans l'étude avec indication de la localité sur quelques cartes géographiques, par l'indispensable bibliographie et par les très bonnes illustrations couleurs.
Je terminerai en félicitant l'auteur pour cette étude très fouillée et très bien illustrée. un livre qui deviendra très vite incontournable pour tous, amateurs et professionnels, qui se sont lancés sur la voie de l'étude ou de la collection des gastéropodes terrestres et des Placostylidae en particulier, une famille regroupant des espèces dont les élégantes coquilles ne laisseront personne indifférent.

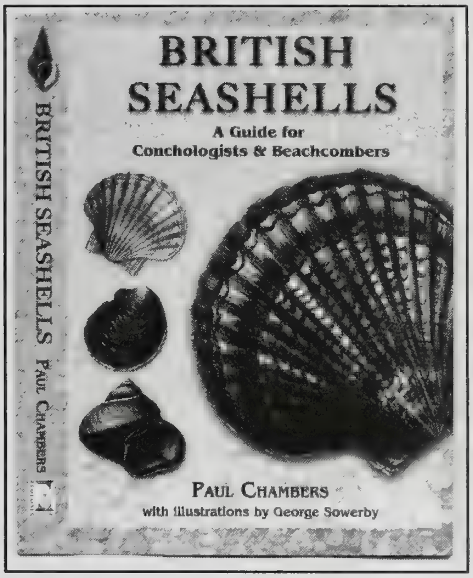
Roland Houart

CHANNEL ISLAND MARINE MOLLUSCS AN ILLUSTRATED GUIDE TO THE SEASHELLS OF JERSEY, GUERNSEY, ALDERNEY, SARK AND HERM

par **Paul Chambers**

Prix : 12,31 £ + frais d'envoi.

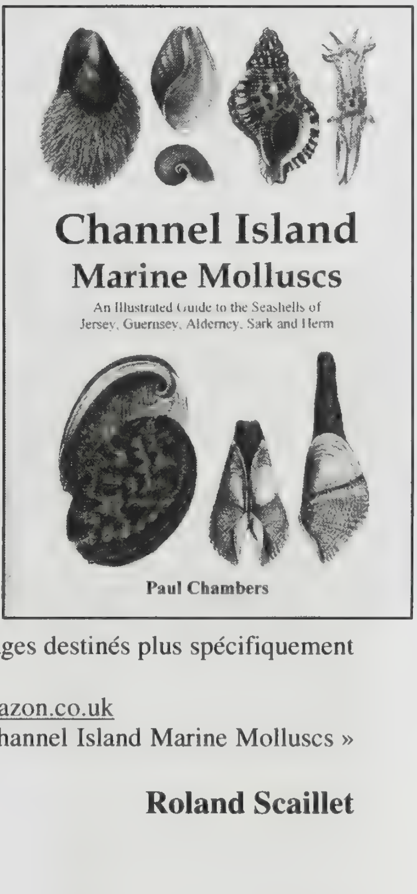
Charonia Media - UK 2008
www.amazon.co.uk


BRITISH
SEASHELLS
A Guide for
Conchologists & Beachcombers
PAUL CHAMBERS
with illustrations by George Sowerby
BRITISH SEASHELLS PAUL CHAMBERS

Voici un livre écrit par un passionné de conchyliologie, **Paul Chambers**, amateur éclairé qui a compilé dans cet ouvrage quelques 407 petits chapitres individuellement dédiés à un représentant de la faune malacologique marine (gastéropodes, bivalves et scaphopodes) des Iles Britanniques. Chaque chapitre comporte des données historiques et anecdotiques relatives à la description originale de l'espèce, au déterminateur ou à des personnalités liées de près ou de loin à ce dernier ou au mollusque en question. On y trouve des informations étymologiques, écologiques, des renseignements concernant la distribution de l'espèce autour des Iles Britanniques, une description très succincte de celle-ci et une illustration consistant en la reproduction de l'iconographie proposée par **George Brettingham Sowerby**, deuxième du nom (1812 - 1884), illustrateur de quelques ouvrages majeurs du 19ème siècle en conchyliologie, comme par exemple le fameux « Thesaurus Conchyliorum ». **Ce n'est donc pas un ouvrage destiné à la détermination des espèces**. Il ne comporte d'ailleurs aucune clé de détermination, ni outil du genre. Il s'agit plutôt d'une approche culturelle de la conchyliologie des Iles Britanniques destinée à intéresser les amateurs, les naturalistes ou à susciter de nouvelles vocations de collectionneur.

Paul Chambers n'est pas un inconnu des sciences naturelles, il possède un MSc et un PhD en micropaléontologie du « University College London » et fut le producteur d'émissions télévisées, entre autres de la BBC, comme « Walking with Dinosaurs ».

Sa passion pour la conchyliologie l'a poussé à publier récemment un autre ouvrage dédié aux 479 espèces de la faune malacologique des îles anglaises de la Manche (Jersey, Guernsey, Alderney, Sark et Herm) : **« Channel Island Marine Molluscs ».** Comme pour l'ouvrage précédent, il s'agit d'une « checklist » d'espèces agrémentée de nombreuses informations relatives aux mollusques de la zone étudiée. L'approche culturelle, historique et iconographique des mollusques des Iles Anglo-Normandes y est également présente. **Une fois de plus, ce livre n'est pas un outil de détermination**. A cet effet, l'auteur renvoie le lecteur, à juste titre, à toute une série d'autres ouvrages destinés plus spécifiquement à cette tâche.


Channel Island
Marine Molluscs
An Illustrated Guide to the Seashells of Jersey, Guernsey, Alderney, Sark and Herm
Paul Chambers

Il s'agit donc ici de deux livres atypiques que l'on peut se procurer sur www.amazon.co.uk
aux prix indicatifs de 15,65 £ pour « British Seashells » et de 12,31 £ pour « Channel Island Marine Molluscs » (Ces prix sont sujets à modifications et frais de port non compris.)

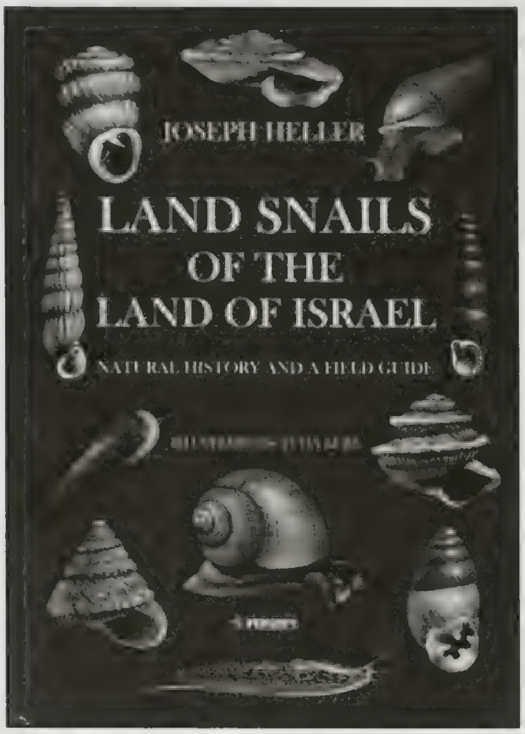
Roland Scaillet

LAND SNAILS OF THE LAND OF ISRAEL

par **Joseph Heller**

pp. 1-360, nombreux dessins NB et couleurs et nombreuses photographies couleurs
En anglais.
Format 170 x 240 mm, couverture rigide.
Prix : 75 euros + frais d'envoi.

Pensoft Publishers.
ISBN 978-954-642-510-2
www.pensoft.net


JOSEPH HELLER
LAND SNAILS OF THE LAND OF ISRAEL
NATURAL HISTORY AND A FIELD GUIDE

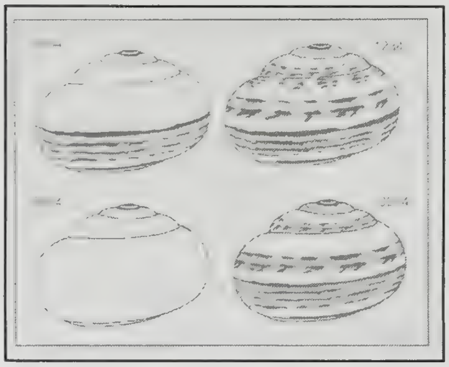
La région du Proche Orient qui rassemble l'actuel état d'Israël et les Territoires de la Palestine (désignée ici par le vocable "Land of Israel") compte plus d'une centaine d'espèces de gastéropodes terrestres. A cela, plusieurs raisons, dont des paysages variés et des climats assez différents selon les régions, conjugués à une histoire géologique sans catastrophes majeures. Un tel nombre justifie à lui seul l'intérêt d'un livre présentant ces espèces avec description générale, distribution, iconographie et critères de détermination : et cet aspect est couvert dans l'ouvrage dont je vous parle.

MAIS il y a encore beaucoup mieux : comme le dit son auteur principal, il s'agit aussi (peut-être même surtout) d'une livre d'histoire naturelle extrêmement intéressant. En effet, sur base de son expérience personnelle, de sa collaboration avec Zeev Arad et d'une solide documentation, l'auteur aborde tous les aspects de l'étude des Terrestres, et d'ailleurs aussi des Dulcicoles, que tout malacologue se doit de connaître. Jugez-en plutôt par le menu de la partie "Histoire naturelle des Terrestres" : la coquille, l'anatomie, l'éthologie, la résistance à la dessiccation et à la chaleur, la prédation, les moyens de défense, la biogéographie, les relations avec l'Homme. Même en étant aguerri dans le domaine, on apprend encore des tas de choses sur les gastéropodes terrestres et, dans la plupart des cas, ces informations sont valables aussi bien pour la faune Européenne que pour celle restreinte au Proche Orient.

Pene sidonensis
Pene syriaca

Cerise sur le gâteau : on remet le couvert de l'histoire naturelle, mais cette fois pour les mollusques d'eau de la même région. Et là, il s'agit d'un domaine encore bien moins couvert par la littérature existante.

On aura bien compris que je recommande chaudement à tous les malacologues (et même les naturalistes un peu avertis) l'achat de cet ouvrage remarquable. J'ai moi-même un peu hésité devant le prix que j'ai du payer (car je l'ai acheté, bien sûr) mais je ne regrette pas l'investissement pour les heures de bonheur à parcourir ce beau livre !



Claude Vilvens

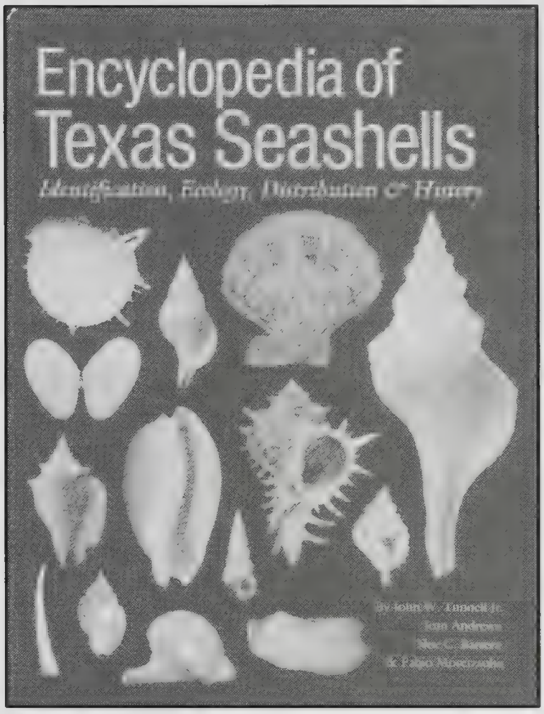
ENCYCLOPEDIA OF TEXAS SEASHELLS

par **John W. Tunnell Jr., Jean Andrewws, Noe C. Barrera & Fabio Moretzsohn**

pp. 1-512, toutes les illustrations en couleur et photographies couleurs
En anglais.
Format 220 x 285 mm, couverture rigide.
Prix : 50.00 dollars + frais d'envoi.

Texas A§M University Press.
ISBN-13 : 978-1-60344-141-4
ISBN-10 : 1-60344-141-7

www.tamupress.com


Encyclopedia of Texas Seashells
Identification, Ecology, Distribution & History
By John W. Tunnell Jr.
Jean Andrews
Noe C. Barrera
& Fabio Moretzsohn

Voici un magnifique ouvrage sur les mollusques marins des côtes du Texas ! Bien sûr, le lecteur focalisera tout d'abord sur la partie descriptive des espèces. Et pas de déception, bien au contraire : après une présentation très à jour d'une famille, on trouve une description claire des espèces texanes de cette famille avec taille, distribution, habitat et remarques additionnelles (éthologie, synonymes, etc), le tout accompagné de bonnes photographies (le nombre de spécimens représenté dépend de la variabilité de l'espèce et des caractères à mettre en évidence).

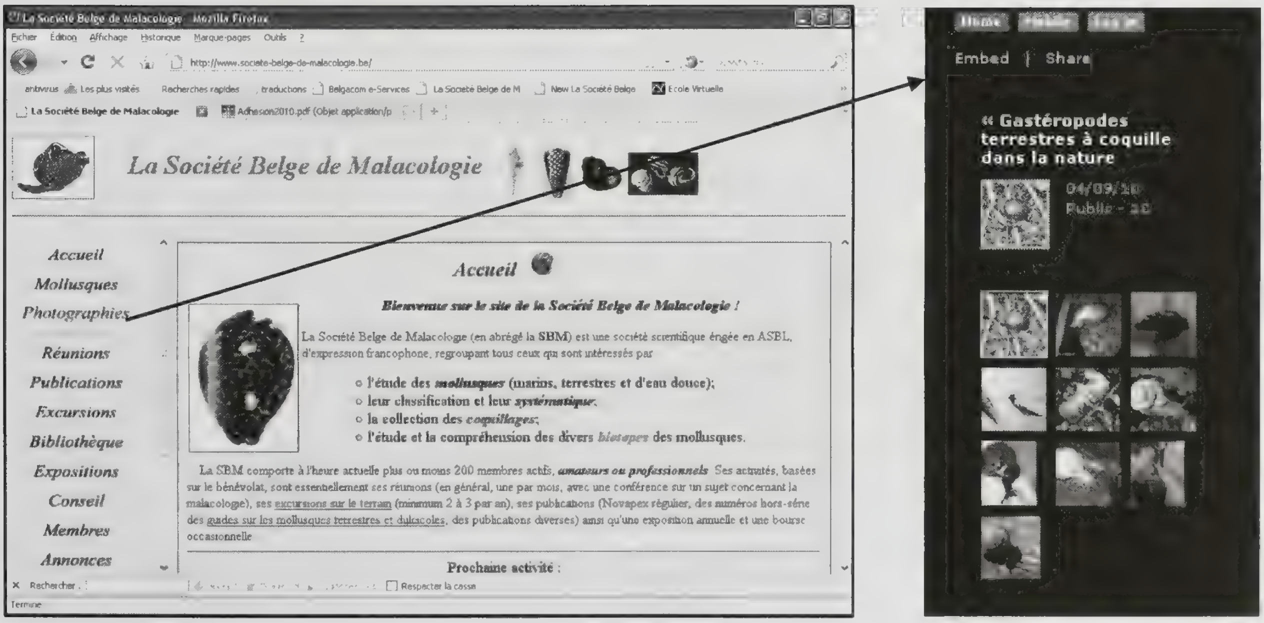
Mais il y a encore autre chose. On trouve en effet dans la première partie une chapitre consacré aux occurrences des mollusques dans l'histoire des côtes du Texas et, surtout, un chapitre consacré à l'écologie des divers habitats que l'on peut rencontrer sur ces côtes : mangroves, baies ouvertes, rivages rocheux, etc … avec, pour chaque milieu, une belle planche couleur rassemblant les mollusques (gastéropodes et bivalves) que l'on peut y rencontrer. Très instructif et transposable dans une large mesure à des côtes d'autres continents.

Par rapport au prix affiché, on peut dire qu'on en a pour son argent : une belle "brique" malacologique ;-) !

Claude Vilvens

Nouvelle adresse pour le site Web de la Société Blege de Malacologie :

http://www.societe-belge-de-malacologie.be/


La Société Belge de Malacologie - Mozilla Firefox
Fichier
Édition
Affichage
Historique
Marque-pages
Outils
?
http://www.societe-belge-de-malacologie.be/
antivirus
Les plus visités
Recherches rapides
traductions
Belgacom e-Services
La Société Belge de M
New La Société Belge
Ecole Virtuelle
La Société Belge de Malacologie
Adhesion2010.pdf (Objet application/p
La Société Belge de Malacologie
Accueil
Mollusques
Photographies
Réunions
Publications
Excursions
Bibliothèque
Expositions
Conseil
Membres
Annonces
Rechercher :
☐ Respecter la casse
Terminé
Embed | Share
« Gastéropodes terrestres à coquille dans la nature
04/09/10

Accueil

Bienvenue sur le site de la Société Belge de Malacologie !

La Société Belge de Malacologie (en abrégé la SBM) est une société scientifique érigée en ASBL, d'expression francophone, regroupant tous ceux qui sont intéressés par

- l'étude des ***mollusques*** (marins, terrestres et d'eau douce);
- leur classification et leur ***systématique***;
- la collection des ***coquillages***;
- l'étude et la compréhension des divers ***biotopes*** des mollusques.

La SBM comporte à l'heure actuelle plus ou moins 200 membres actifs, ***amateurs ou professionnels***. Ses activités, basées sur le bénévolat, sont essentiellement ses réunions (en général, une par mois, avec une conférence sur un sujet concernant la malacologie), ses excursions sur le terrain (minimum 2 à 3 par an), ses publications (Novapex régulier, des numéros hors-série des guides sur les mollusques terrestres et dulcicoles, des publications diverses) ainsi qu'une exposition annuelle et une bourse occasionnelle.

Prochaine activité :

Nous avons reçu

Etienne MEULEMAN

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°252, mars-avril 2010

Sommaire	Page
Calendrier des activités	2
Comptes rendus des activités	
Promenade-découverte des bois de la Donation Royale	5
Conférence: Le castor en Belgique	8
Assemblée Générale	10
Séance de détermination de pelotes de rapace	15
Informations aux membres	
Compte-rendu de l'opération « Batraciens 2009 »	17
Dimanche 21 mars 2010: journée de l'eau	18
Chroniques de l'environnement	
Appel à l'arrêt immédiat et complet du nourrissage du gibier	20
Travaux des membres	
Clé de détermination au stade végétatif des herbacées à grandes feuilles palmées (avec Planche de schémas!)	22

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°253, mai-juin 2010

Sommaire	Page
Calendrier des activités	2
Comptes rendus des activités	
Sortie hivernale consacrée à la détermination des plantes à partir des fruits, tiges séchées et autres caractères végétatifs	4
Chantier de gestion à la Carrière de la Lesse à Resteigne	6
Gestion du Gros Tienne à Lavaux Sainte-Anne	6
Observation de la migration des batraciens	6
Exposé sur les urticacées suivi (du constat) de l'état d'avancement de l'herbier des Facultés Universitaires Notre-Dame de la Paix à Namur	7
Ri de Glan (Neupont): Faune des invertébrés des eaux douces	11
Sortie printanière: observations botaniques et ornithologiques à Rochefort (Carmel, plateau de Lorette, Fond des Valennes, Ravel)	12
Géologie et géomorphologie de la région de Hotton-sur-Ourthe	14
Flore et faune de la mare de Sohier (Wellin) en cours de restauration	25
Travaux des membres	
Comparaison des spectres alimentaires de la Chouette effraie (Tyto alba) et de la Chouette hulotte (Strix aluco)	27
Chroniques de l'environnement	
Les éoliennes de Vonêche (Beauraing)	29
Informations aux membres	
APPEL A TEMOINS !!! La « fontaine » de Resteigne	31

GLORIA MARIS

(Belgique néerlandophone)
Vol. 49, N°1, janvier 2010

CONTENTS

1. *Roland Houart*
Description of a new species of *Chicoreus* (*Triplex*) (Gastropoda: Muricidae) from Sulawesi

2. *Aart M. Dekkers*
A hybrid in the genus *Ministrombus* Bandel, 2007 (Gastropoda: Strombidae) and a new combination for *Strombus variabilis* Swainson, 1820

3. *Juan Horro, Peter Ryall & Emilio Rolán*
Anacithara (Conoidea, Turridae): a new genus to West Africa

BELGIAN JOURNAL OF ZOOLOGY

(Belgique)
Vol. 139, N° 2, juillet 2009

VOLUME 139 (2)

87 **Jianjun PENG, Zhigang JIANG, Guangyong QIN, Qunce HUANG, Yuxiao LI, Zhen JIAO, Fengqiu ZHANG, Huasheng FANG, Jinguo ZHANG, Yanping LU, Xuefeng LIU & Jinpeng LIU**
Mate choice in giant panda (Ailuropoda melanoleuca)

93 **Elisabeth FICHET-CALVET, Emilie LECOMPTE, Frederic VEYRUNES, Patrick BARRIÈRE, Violaine NICOLAS & Kékoura KOULÉMOU**
Diversity and dynamics in a community of small mammals in coastal Guinea, West Africa

103 **Mustafa COSKUN, Tamer KAYIS, Pinar OZALP, Kadir KOCALAR, Cagla Irem TATLICIOGLU & Iskender EMRE**
The effects of a meridic diet on the sex ratio of offspring, on glycogen and protein content, and on productivity and longevity of adult Pimpla turionellae (Hymenoptera: Ichneumonidae) for five generations

109 **Virginia ABDALA, Adriana S. MANZANO, Lucrecia NIETO & Rui DIOGO**
Comparative myology of Leiosauridae (Squamata) and its bearing on their phylogenetic relationships

124 **Thierry KERVYN, Sandrine LAMOTTE, Pierrette NYSSEN & Jacques VERSCHUREN**
Major decline of bat abundance and diversity during the last 50 years in southern Belgium

133 **Pavlína KUNCOVÁ· & Daniel FRYNTA**
Interspecific morphometric variation in the postcranial skeleton in the genus Apodemus

147 **Samira KILANI-MORAKCHI, Nadia ARIBI, Jean-Pierre FARINE, Guy SMAGGHE & Noureddine SOLTANI**
Halofenozide affects sexual behaviour, cuticular hydrocarbons and reproduction in the female German cockroach Blattella germanica *(Dictyoptera, Blattellidae)*

156 **Michael R. WARBURG**
Age and size at metamorphosis of half-sib larvae of Salamandra infraimmaculata *born in the laboratory and raised singly under three different food regimes*

SHORT NOTES

166 **Vincent ZINTZEN & Francis KERCKHOF**
The sponge-inhabiting barnacle Acasta spongites *(Poli, 1795) (Crustacea, Cirripedia), a first record for the southern North Sea: how artificial habitats may increase the range of a species*

169 **Marta BIAGGINI, Valeria NULCHIS, Miguel A. CARRETERO, Riccardo Maria CIPOLLA, Claudia CORTI, Armando NAPPI & D. James HARRIS**
Low genetic differentiation between populations of Podarcis sicula *(Reptilia, Lacertidae) from the Italian islands off the coast of Campania and the mainland*

173 **Pieter BOETS, Koen LOCK, Roger CAMMAERTS, Dieder PLU & Peter L.M. GOETHALS**
Occurrence of the invasive crayfish Procambarus clarkii *(Girard, 1852) in Belgium (Crustacea: Cambaridae)*

LES NATURALISTES BELGES

(Belgique)
Vol. 90, N°3-4, juillet -décembre 2009

LAFONTAINE R.-M. & DE SCHAETZEN R. – Que s'est-il passé depuis l'an 2000 pour les libellules méridionales en Wallonie et à Bruxelles ? 33-46

GOFFART Ph., DEVILLERS Chr. & BERTRAND S. – Observations récurrentes du Leste verdoyant (*Lestes virens*) dans la région de Spa-Malchamps : une population reproductrice s'y maintient-elle ?....... 47-54

GOFFART Ph. – Nouvelle émergence du Sympétrum méridional (*Sympetrum meridionale*) en Wallonie........ 55-61

Tables des matières du volume 90: 2009 et publications de nos sections........ 62-64

SPIRULA

(Pays-Bas)
N° 372, janvier-février 2010

Jubileumcmmissie	NMV 75 jaar verslag van de jubileumdag in Naturalis Leiden	1
Dr. Vollrath Wiese	Felicitatiebrief Deutsche Malakozoologische Gesellschaft	5
Bestuur	Mattheus Marinus Schepman (1847-1919) and his contributions to malacology	6
A. bij de Vaate	Kruipende huisjes in Flevoland	7
Diverse bronnen	Excursies + Malacologische agenda Nederland - 2010	8
H.K. Mienis	Een gemengde populatie van de Grote en Vale clausilia in Monnickendam	11
A.D.P. v. Peursen & J. Kuiper	Verslag van malacologische inventarisatie voormalige vuilstort Langerijp bij Appingedam (provincie Groningen) op 15-08-2009	12
J. Kuiper	Een onverwachte verstekeling	16
J. Kuiper	Boekbespreking	17
G. Kronenberg	Uitreiking van het Spirula Jubileumnummer op 21 november 2009	18
C.J.P.J. Margry	Een bolle duinhoren *Cochlicella barbara* (Linnaeus, 1758) als verstekeling in Rucola	19
H.K. Mienis	Een eerste slak in het Formerumerwiel, Terschelling	21
H.K. Mienis	De Gele aardslak Limacus flavus herontdekt in West-Terschelling	22
C.M. Neckheim & H.K. Mienis	Een voorlopig overzicht van de malacofauna van de fortificaties van de Stelling van Amsterdam in Noord-Holland	23
H.K. Mienis	Nogmaals Gekielde loofslakken *Hygromia cinctella* in Purmerend	30
R.A. Bank	Nieuw beschreven continentale molluskensoorten – (new taxa: continental molluscs)	31
R.A. Bank	Artikelen in tijdschriften - (journal papers: continental malacology)	33
R.A. Bank	Nieuwe boeken - new books	40

XENOPHORA

(France)
N°130, avril-mai-juin 2010

4 Le coin du Débutant par G. Jaux
7 Les coquillages voient la vie en rose par P. Dardart
8 Les types du MNHN par A. Robin
11 Journée découverte dans le vignoble champenois par P. Dardart
12 Vu sur le Web par B. Mathé
13 *Conus consors* une richesse à découvrir par Y. Charital
17 Les *Homalocantha* et leur identification (2ème partie) par G. Granpoder
20 Coup de projecteur sur les Neritidae par L. Limpalaer (2ème partie)
23 Courrier des Lecteurs
24 Espèces introduites : du nouveau en Côtes d'Armor par M. Le Quément
25 *La grève aux Chitons* par S. Guyonneau
28 Ile Maurice ou le pays des illusions conchyliologiques perdues par J-P. Sidois
32 Anciens et Modernes par D. Ledon
34 Les plus vieilles moules de France par Th. Brosset
35 La Malédiction du Triton par M. et J-P. Lacroix
39 Du nouveau au Gabon par J. Gourayeb
40 Histoire courte par T. Gobbi
41 Lu pour vous par R. Houart / Petites annonces
42 Echo...coquillages

CLUB CONCHYLIA MITTEILUNGEN
(Allemagne-Autriche)
N°13, février 2010

Inhalt

- Vorwort des I. Vorsitzenden 5
- Protokoll der JHV 2009 7
- Grußwort der DMG 10
- Personalia 11
- HANS TURNER (1928-2009) 11
- Wir gratulieren 14
- Aus dem Clubleben 14
  - Einladung zum 4. deutsch-schweizer Treffen 14
  - Einladung zur außerordentlichen Mitgliederversammlung 15
  - Einladung Regionaltreffen Ost 15
  - Regionalstammtisch West 15
  - KLAUS KITTEL: Bericht 3. deutsch-schweizer Treffen in Zornheim 15
  - Termine 17
  - Brief von KLAUS SATZER 17
- INGO KURTZ: Schneckenbörse im Jubiläumsjahr 2009 18
- THERESIA KITTEL: Bilder der Ausstellungen JHV 2009 19
- THERESIA KITTEL: Bilder von der JHV 2009 20
- BURKHART FENGLER: Von Schnecken an bestimmten Orten 22
- BERND SCHEIBA: Nebensächliche Bemerkungen über die schöne Vallonia 23
- INGO KURTZ: Sammeln in Khorfakan, Golf von Oman 23
- Anonymus: Schnecken aus der Römerzeit 31
- ERICA STEINEGGER: Auf neuer Entdeckungsreise im Drachenland Taiwan 32
- PIA HEINEMANN: Die Schnecke die zu Pflanze wird 44
- MANFRED BLÖCHER: Die Urtriebe des Menschen Sammeln und Jagen (VI) 45
- KLAUS KITTEL: Der Junge Schneckensammler (9): Perlmutt und Perlen 57
- Presseschau 61
- Buchbesprechungen 67
- Erwiderung G. T. POPPE 70
- Club-Händler werben bei Club-Mitgliedern 72

MOLLUSC WORLD

(Grande-Bretagne)
N°22, mars 2010

CONTENTS

3 Field Meeting at Winchester, June 2009 *June Chatfield*

7 Skye Blog *Jan Light*

10 Distribution of *Tectura testudinalis*
Steve Wilkinson

13 Book Review: Edible Seashore
Jan Light

14 Shells on the beaches of Skye
Jim Logan

15 Deaths of Roman Snails
David Long and Martin Willing

16 Chitons of Skye
Steve Wilkinson

18 Molluscs at Ardmore Bay
Julia Nunn
***Pecten* Passengers** *Jan Light*

19 *Doto onusta* *Julia Nunn*

21 Snailing on Skye
Adrian Sumner

24 Slugs in Skye *Chris du Feu*

26 Cooking smaller shellfish
Bas Payne

27 The white slug of Storr
Roger Cottis and Chris du Feu

28 The Lion King – a modern use of Money Cowries
John Llewellyn-Jones

29 Book Review: British Seashells
Jan Light

30 The Highland Biological Recording Group
David O'Brien and Chris du Feu

30-32 Calendar of meetings and events

JOURNAL OF CONCHOLOGY

(Grande-Bretagne)
Vol. 40, N°2, février 2010

Journal of Conchology

Vol.40, Part 2, February 2010

Hutterer R, Greve C & Haase M Three species of *Theba* (Gastropoda: Helicidae) from a Pleistocene dune in SW Morocco 121

Oliver PG, Nolf F & Verstraeten J On the identity of *Solecurtus scopula* (Turton 1822) and the establishment of *S. candidus* (Brocchi 1814) 129

Yanes Y, Martín J, Delgado JD, Alonso MR & Ibáñez M Active disguise in land snails: *Napaeus badiosus* (Gastropoda, Pulmonata, Enidae) from the Canary Islands 143

Simone LRL A new genus and species of camaenid from the Amazon rainforest, Brazil (Pulmonata, Helicoidea) 149

Albano PG & De Mattia W Rediscovery of the holotype of *Pterocera kochii* Freyer 1855 (Gastropoda: Strombidae) 163

Caballer M, Ortea J & Canteras JC Re-instatement of the name *Eubranchus capellinii* (Trinchese 1879) (Mollusca: Opisthobranchia: Nudibranchia) 169

Glöer P, Falniowski A & Pešić V The Bithyniidae of Greece (Gastropoda: Bithyniidae) 179

Spadini V & Manganelli G A large clavatulid species first reported from the early Pliocene of Italy (Gastropoda, Neogastropoda, Conoidea) 189

Li B, Li X & Kilburn RN Report on the genus *Tritonoturris* s. l., (Gastropoda: Conoidea) from the South China Sea 193

Fehér Z, Deli T & Sólymos P Revision of *Granaria frumentum* (Draparnaud 1801) (Mollusca, Gastropoda, Chondrinidae) subspecies occurring in the eastern part of the species' range 201

Abbes I, Liberto F, Castillejo J & Nouira S A review of slugs and semi-slugs of Tunisia (Testacellidae, Milacidae and Limacidae) 219

Cernohorsky NH, Horsák M & Cameron RAD Land snail species richness and abundance at small scales: the effects of distinguishing between live individuals and empty shells 233

COMMUNICATIONS

Anderson R & McCormack S Re-discovery of *Omphiscola glabra* (O.F. Müller) (Lymnaeidae) in Ireland 243

Örstan A Activities of four species of land snails at low temperatures 245

Light J & Chambers P First Live Record for *Truncatella subcylindrica* (L. 1767) from the Channel Islands 247

CORRIGENDA 248

AMERICAN CONCHOLOGIST

(U.S.A. Sud-Est)
Vol. 38, N° 1, mars 2010

IN THIS ISSUE

Letters and Comments --- 3

***Costoanachis sertulariarum* (d'Orbigny, 1839) in the Gulf of Mexico by Emilio F. García -------------------------------------- 4**

The Power Of One by Emilio F. García ------------------------- 6

SCUM XIV: Southern California Unified Malacologists by Lindsey T. Groves -- 7

Pearls in the Nevada Desert? by Joaquin Inchaustegui ------9

***Systematic Classification of Recent and Fossil Conoidean Gastropods*, by John K. Tucker and Manuel J. Tenorio, ConchBooks, 2009: a review by Bruce Neville ---------------- 12**

In Memoriam -- 14

Dealer Directory -- 15

The World of Cones According to Tucker & Tenorio (2009) by Bruce Neville (images by T. Eichhorst)-------------- 18

Astronaut Trail Shell Club holds 30th Space Coast Seashell Festival by Bobbi Cordy ------------------------------ 20

North Carolina Shell Show 25-27 September 2009 by Tom Eichhorst -- 21

Snails and Coal Mining by Tom Eichhorst -------------------- 22

***The Freshwater Mussels of Ohio*, 2009: a review by Tom Eichhorst -- 24**

Shellebration Boston: COA 2010 ------------------------------ 25

Jean Andrews (1923 - 2010) by Tom Eichhorst --------------- 29

ANNALS OF CARNEGIE MUSEUM

(U.S.A. – Pennsylvanie)
Vol. 78, N° 4, mars 2010

A new trematopid amphibian (Temnospondyli: Dissorophoidea) from the Upper Pennsylvanian of western Pennsylvania: earliest record of terrestrial vertebrates responding to a warmer, drier climate .... **David S Berman, Amy C. Henrici, David K. Brezinski, and Albert D. Kollar** **289**

Larva, pupa, and biology of the crane fly *Indotipula demarcata* (Brunetti) from Taiwan (Insecta: Diptera: Tipulidae) .... **Chen W. Young and Chen L. Chu** **319**

A phytogeographical and ecological study of *Prenanthes crepidinea* Michaux (Asteraceae) .... **Bonnie L. Isaac** **325**

Neogene decapod Crustacea from southern Chile .... **Rodney M. Feldmann, Carrie E. Schweitzer, and Alfonso Encinas** **337**

Index to Volume 78 .... **367**

THE FESTIVUS
(U.S.A. – Californie)
Vol. XLII, N°3, mars 2010

CONTENTS

Club news 30

Hyotissa mcgintyi (Bivalvia, Gryphaeidae) from two islands in the Leeward Islands, Lesser Antilles, West Indies, with notes on the genus.
SUSAN J. HEWITT 31

A three-minute survey of the marine mollusks of the island of Sint Eustatius, Leeward Islands, West Indies
SUSAN J. HEWITT 35

AMS/WSM 2010 San Diego, California, June 26-July 1, 2010 38

In remembrance of Margaret Mulliner, 1926-2010
CAROLE M. HERTZ 39

THE FESTIVUS
(U.S.A. – Californie)
Vol. XLII, N°4, avril 2010

CONTENTS

Club news 42

Shell microstructures in early mollusks
MICHAEL J. VENDRASCO, SUSANNAH M. PORTER, ARTEM V. KOUCHINSKY, GUOXIANG LI & CHRISTINE Z. FERNANDEZ 43

THE FESTIVUS
(U.S.A. – Californie)
Vol. XLII, N°5, mai 2010

CONTENTS

Club news 56

Learning to clam along Oregon's central coast
ROBERT DEES 57

Stramonita biserialis at Point Loma, California
BENJAMIN PISTER 61

THE NAUTILUS
(U.S.A.)
Vol. 124, N°1, avril 2010

Jason S. Biggs **Maren Watkins** **Patrice Showers Corneli** **Baldomero M. Olivera**	Defining a clade by morphological, molecular, and toxinological criteria: distinctive forms related to *Conus praecellens* A. Adams, 1854 (Gastropoda: Conidae)	1
Somsak Panha **Chirasak Sutcharit** **Dang Ngoc Can**	An anatomical note on *Moellendorffia eastlakeana* (Möllendorff, 1882) a camaenid land snail from Vietnam (Gastropoda: Pulmonata: Camaenidae)	20
Kristiina Ovaska **Lyle Chichester** **Lennart Sopuck**	Terrestrial gastropods from Haida Gwaii (Queen Charlotte Islands), British Columbia, Canada, including description of a new northern endemic slug (Gastropoda: Stylommatophora: Arionidae)	25
Cléo Dilnei de Castro Oliveira **Tatiana Huguenin Morales**	How the number of hinge teeth may induce errors in the taxonomy of Nuculidae and Nuculanidae (Bivalvia)	34
Richard E. Petit **Lyle D. Campbell** **Sarah C. Campbell**	A new species of *Zeadmete* (Gastropoda: Cancellariidae) from South Carolina, a genus previously unknown in the Atlantic Ocean	41
Monica A. Fernandez **Silvana C. Thiengo** **Fernando S. M. Bezerra** **Lucia M. S. Alencar**	Current distribution of the exotic freshwater snail *Helisoma duryi* (Gastropoda: Planorbidae) in Brazil	44
Free Espinosa **Georgina A. Rivera-Ingraham** **José C. García-Gómez**	Early stages of development in the endangered limpet *Patella ferruginea* Gmelin, 1791 (Gastropoda: Patellidae)	51

Notice 54

STROMBUS
PUBLICACAO OCASIONAI DA CONQUILIOLOGISTAS DO BRASIL

(Brésil)
N° 016, 1-2, Décembre 2009

Contents

Research Articles

Gastropods associated with the green seaweed *Caulerpa racemosa*, on two beaches of the Northern coast of the State of São Paulo, Brazil.
Fosca P. P. Leite; Mirna R. S.Tambourgi & Carlo M. Cunha........ 1

New gastropods from the São Pedro e São Paulo Archipelago, Brazil (Vetigastropoda and Caenogastropoda).
Luiz R. L. Simone........ 11

Conus carioca Petuch, 1986 (Neogastropoda: Conidae) on the Brazilian coast.
Renata S. Gomes........ 19

CONCHYLIA

Vol. 40, N° 3-4, 2009

Conchylia

Inhalt von / Contents of **40** (3/4), 2009

Inhalt / Contents 1

Groh, K., Rähle, W., Kittel, K, Hemmen, J. & Bank, R.: Corrections and additions to Mary B. Seddon's "The landsnails of Madeira. An illustrated compendium of the landsnails and slugs of the Madeiran archipelago" (2008) 2

Herrmann, M. & Suduiraut, E. G. de: Two new species of *Vexillum* from the Philippines and Malaysia with remarks on *Vexillum plicarium* (Linnaeus, 1758), its synonyms and the identity of *Vexillum citrinum* (Gmelin, 1792) (Gastropoda: Costellariidae) 26

Herrmann , M.: A new species of *Vexillum* (*Costellaria*) (Gastropoda: Costellariidae) from deep water off Balut Island in the Philippines 34

Lorenz, F.: Two new species of Ovulidae from the Western Pacific (Gastropoda: Ovulidae) 38

Morrison, H. M. & Whisson, C. S.: Description of *Anguipecten simoneae* n. sp. from northern Western Australia (Bivalvia, Pectinidae) 45

Lorenz, F.: *Pustularia globulus marerubra* n. ssp., a new subspecies from the Red Sea (Mollusca: Gastropoda: Cypraeidae) 52

Lorenz, F. & Mostert, S: *Lyncina broderipii* (G. B. Sowerby I, 1832) and *Contradusta barclayi* (Reeve, 1857) 55

Boeters, H. D.: *Thibynella*, a new subgenus of *Bythinella* Moquin-Tandon, 1856 56

Bank, R.: Systematic list of the Recent terrestrial gastropods of the Madeiran archipelago 61

Lorenz, F. & Mostert, S: *Barycypraea fultoni fultoni* (G. B. Sowerby III, 1903) .... Umschlag hinten / cover back

TRITON

(Israël)
N°21, mars 2010

CONTENTS

1. MARINE MOLLUSCS

Heiman E.L., Mienis H.K. PROTOCONCHS OF MURICIDAE........ 1
Heiman E.L., Mienis H.K. & V. Yerenburg *MUREX FORSKOEHLII* IN THE HAIFA BAY AREA........ 2
Heiman E.L. & Mienis H.K. *MUREX FORSKOEHLII SPINIFER* A NEW SUBSPECIES FROM EAST SINAI 5

3. COWRIES: INTRASPECIFIC VARIATION, NEW INFORMATION

Heiman E.L. A "FIVE-CRITERIA-APPROACH" (FCA) IN TAXONOMY OF CYPRAEIDAE........ 10
———. *CRIBRARULA FISCHERI ASTARYI* IS A FORM OF *C. CRIBRARIA.* 11
———. MORE ON *CRIBRARULA CRIBRARIA GASPARDI*........ 14
———. *CYPRAEA TAITAE*—A SYNONYM OF *C. CRIBRARIA*........ 15
———. *CRIBRARULA CRIBRARIA OCCIDENTALIS* OF WEST AUSTRALIA, A SYNONYM OF *C. CRIBRARIA FALLAX*........ 17
———. *CRIBRARULA CRIBRARIA FALLAX*: A RECYCLED OLD NAME........ 19
———. ON THE SYNONYMY OF *CRIBRARULA CRIBRARIA EXMOUTHENSIS* 20
———. *CYPRAEA HADDNIGHTAE*, A SYNONYM OF *C. CRIBRARIA*........ 21
———. THE GENUS *CRIBRARULA* IN THE PACIFIC OCEAN (SUMMARY OF THE SUPPLEMENT 2 TO TRITON 21)........ 22
———. MORE SYNONYMS OF *C. CRIBRARIA* FROM WEST AUSTRALIA........ 24
———. *BLASICRURA INTERRUPTA* (GRAY, 1824) AND RELATED TAXA (SUMMARY OF THE SUPPLEMENT 3 TO TRITON 21)........ 26

4. LAND SNAILS

Örstan, A. A NEW RECORD OF *VERTIGO PUSILLA* FROM TURKEY........ 27
Henk K. Mienis, Svetlana Vaisman & Oz Rittner A FIRST INTERCEPTION OF THE EDIBLE LAND SNAIL *HEMIPLECTA DISTINCTA* AT AN AIRPORT IN ISRAEL (GASTROPODA, ARIOPHANTIDAE) 28
Burçin Aşkım Gümüş SEARCHING FOR *LINDHOLMIOLA LENS* (A. FÉRUSSAC, 1832) (MOLLUSCA, GASTROPODA, STYLOMMATOPHORA) IN WESTERN ANATOLIA........ 31

5. NEWS, NEW FINDS, INTERESTING SHELLS

Inchaustigui, J. PEARLS IN THE NEVADA DESERT?........ 35
Yerenburg I. & Yerenburg V. UNUSUAL FORMS OF *M. FORSKOEHLII* FROM THE HAIFA BAY AREA.... 38
Yerenburg I. & Yerenburg V. DEFORMED *CONOMUREX PERSICUS* FROM THE HAIFA BAY AREA....... 40
Singer, A. UNUSUAL FIND IN ELAT........ 40
Holtzer, E. THAIS SACELLUM AND ERGALATAX JUNIONAE IN AKHZIV........ 40

6. IMPORTANT INFORMATION—TRITON 21 SUPPLEMENTS (free pdf files)

Heiman, E.L.& Mienis H.K. PROTOCONCH OF MURICIDAE. PART 1 Supplement 1
Heiman, E.L. THE GENUS *CRIBRARULA* IN THE PACIFIC OCEAN Supplement 2
Heiman, E.L. *BLASICRURA INTERRUPTA* (GRAY, 1824) AND RELATED TAXA Supplement 3

MOLLUSCAN RESEARCH

(Australie)
Vol. 30, N°1, mars 2010

Table of contents

1 **Three new species and two new genera of land snails from the Bonaparte Archipelago in the Kimberley, Western Australia (Pulmonata, Camaenidae)**
FRANK KÖHLER

17 **On the shell and radular morphology of two endangered species the genus *Margarya* Nevill, 1877 (Gastropoda: Viviparidae) from lakes of the Yunnan Plateau, Southwest China**
FENGYUE SHU, FRANK KÖHLER & HONGZHU WANG

25 **Inverse life positions of three species in the genus *Cadella* (Bivalvia: Tellinidae)**
SUGURU UJINO & AKIHIKO MATSUKUMA

29 **Amylolytic and cellulolytic activities in the crystalline style and the digestive diverticulae of the freshwater bivalve *Dreissena polymorpha* (Pallas, 1771)**
FRÉDÉRIC PALAIS, GUILLAUME JUBEAUX, ODILE DEDOURGE-GEFFARD, SYLVIE BIAGIANTI-RISBOURG & ALAIN GEFFARD

37 **Genetic basis of racemism and ease of interchiral mating in a clausiliid species of snails**
HIROKI UTSUNO, SHITHILA KASEM, HIROSHI FUKUDA & TAKAHIRO ASAMI

48 **Patterns of abundance, growth and size of the tropical intertidal chiton *Acanthopleura gemmata***
S.S. BARBOSA, B. P. KELAHER & M. BYRNE

53 ***Austrofusus* Kobelt, 1879 replaced by *Aethocola* Iredale, 1915 in New Zealand (Mollusca: Gastropoda: Buccinulidae)**
ALAN G. BEU & BRUCE A. MARSHALL

56 **A replacement name for *Kapala* Ponder, 1982 (Gastropoda: Buccinidae)**
WINSTON F. PONDER

KEPPEL BAY TIDINGS

(Australie – Queensland)
Vol. 48, N° 4, décembre – Février 2010

- L. RUTHERFORD: An Exciting day at Clairview
- E. COUCOM: An unrecognised species of the genus *Amoria* from Eastern Australia
- J. SINGLETON: Just a Quirky *Quercinus*?
- E. COUCOM: More Cymbiolas
- T. WHITEHEAD: A surprising find in unusual place!
- E. COUCOM: Volunteer's Christmas party
- L. RUTHERFORD: What a beauty!
- A farewell to healther carter

THE CHIROBOTAN

ちりぼたん

(Japon)
Vol. 40, N°2

文献紹介

海に生きるものたちの掟／Land snails and slugs of Russia and adjacent countries／改訂・石川県の絶滅のおそれのある野生生物／改訂・熊本県の保護上重要な野生動植物

ニュース

淡水貝類研究会第15回研究集会報告

Kazunori Hasegawa. 2010. A taxonomical note on the species previously recorded as "*Turritellopsis acicula stimpsoni* Dall" in the northwestern Pacific. 69
Kazunori Hasegawa. 2010. Morphology and distribution of *Mitra schepmani* Salisbury & Suduiraut, 2003 (Gastropoda: Mitridae) in Japan. 79
Takashi Shimaguchi. 2010. Fossil *Euhadra decorata diminuta* with *Palaeoloxodon naumanni* from Shitsukari, Higashidori Village, Aomori Prefecture. 87
Takashi Okutani & Katsuhiko Wada. 2010. Scientific name of the Akoya pearl oyster－Current status and comments. 90
Takami Nobuhara. 2010. Deep-sea gastropod fossils occupied by hermit crabs living on beaches. 95
Takashi Matsubara, Takenori Sasaki, Yasuhiro Ito & Kazutaka Amano, 2010. Illustrations of Cenozoic molluscan type specimens preserved in the University Museum, the University of Tokyo. Part 6. The genus *Phacosoma*. 98
Takashi Matsubara, Takenori Sasaki, Yasuhiro Ito & Kazutaka Amano, 2010. Illustrations of Cenozoic molluscan type specimens preserved in the University Museum, the University of Tokyo. Part 7. The genus *Yabepecten* (Bivalvia: Pectinidae). 107
Takashi Okutani, 2010. Fifty years of Chiribotan－personal memories. 115

VENUS

(Japon)
Vol. 68, N° 3-4, mars 2010

Original Articles

Paul Callomon and Martin Avery Snyder: On some small *Fusinus* from the East China Sea (Gastropoda: Fasciolariidae), with description of a new species and notes on protoconch morphology 101
Iwao Hamatani and Tsunemi Kubodera: A new species of abyssal opisthobranch belonging to the genus *Bathydoris* Bergh, 1884 (Opisthobranchia: Nudibranchia: Doridoidea) from Japan 113
Tomoyuki Nakano, Yukito Kurihara, Hirofumi Miyoshi and Shigeo Higuchi: Molecular phylogeny of *Neptunea* (Gastropoda: Buccinidae) inferred from mitochondrial DNA sequences, with description of a new species 121
Kōji Yokogawa, Hiroshi Ishikawa and Yoichi Hamamura: Genetic divergence between two forms of the pulmonate limpet *Siphonaria japonica* (Gastropoda: Siphonariidae) 139
Akihisa Shirai, Takaki Kondo and Tadashi Kajita: Molecular markers reveal genetic contamination of endangered freshwater pearl mussels in pearl culture farms in Japan 151
Kazutaka Amano and Akihiko Suzuki: Redescription of "*Calyptogena*" *shiretokensis* Uozumi (Bivalvia: Vesicomyidae) from the Miocene Rusha Formation on the Shiretoko Peninsula, eastern Hokkaido, Japan 165

Short Notes

Taisei Nakayama: A new species of the family Epitoniidae in the Nagai Collection in Wakayama Prefectural Museum of Natural History 173
Go Onoda, Tatsujiro Suzuka, Yuka Takeuchi, Toshihiko Konagai and Kiyonori Tomiyama: Spermatophore transfer in the dioecious tidal snail *Cerithidea rhizophorarum* (Gastropoda: Potamididae) 176
Yukito Kurihara and Toru Tokita: Occurrence of *Halicardia* sp. cf. *houbricki* Poutiers & Bernard, 1995 (Bivalvia: Verticordiidae) from the Miocene of Japan 179

THE KOREAN JOURNAL OF MALACOLOGY

(Corée)
Vol 25, N° 2, août 2009

한국패류학회지

CONTENTS

91 **Two Unrecorded Molluscan Species (*Atrina teramachii* and *Liocranchia reinhardti*) from Korean Waters**
Min Ho Son

93 **A Report on the Mass Mortality of the Farmed Japanese Scallop, *Patinopecten yessoensis* on the Korean Coasts of the East Sea**
Q-Tae Jo, Su-Kyoung Kim, Chu Lee, Mohammad M. Rahman, Chae-Sung Lee and Bong-Se Oh

97 **Fundamental Study about Bottom-Clinging Rate in Free Floating Larva by Infiltration Flow in Tidal**
Sang Ho Back, Kwang Jae Park, Young Je Park, Jun Je Cheon, Kee Chae Cho and Yi Un Kim

105 **Induction of Sex Maturation and Growth in Comb Pen Shells, *Atrina pectinata* per Microalgae Classes**
Tae Seok Moon, Pil Gue Jo, Byoung-Hak Kim, Ki Yeol Park, Hag Dong Ku, Yun-Kyung Shin and Young Sub Lym

113 **Effect of Temperature on Induced Sexual Maturation of the Hard Clam, *Meretrix petechiails* (Lamarck) Broodstock**
Byoung-Hak Kim, Tae-Seok Moon, Ki-Yeol Park, Young-Guk Jin and Yun-Kyung Shin

121 **Effect of Temperature Condition on Growth of Juvenile Abalone, *Haliotis discus hannai* with the Different Feeds**
Sung Hwoan Cho and Young Jin Cho

127 **Maturity and Spawning Period of the Common Octopus, *Octopus vulgaris* in the South Sea of Korea**
Hyunjung Kang, Yeonghye Kim, Sungyeon Kim, Dongwoo Lee, Youngmin Choi, Daesoo Chang and Woo-Seok Gwak

135 **Cellular Immune Responses of the Manila Clam, *Ruditapes philippinarum*, Exposed to Cadmium Chloride**
Kyung-Il Park, Min-Soon Choi, Sung-Woo Park, Kwan-Ha Park, Sang-Hoon Choi and Jong-Man Yoon

145 **Ultrastructural Description on Oogenesis of the Melania Snail, *Semisulcospira libertina libertina* (Gastropoda: Pleuroceridae)**
Eun Kyoung Kim and Jung Sick Lee

153 **Phylogenetic Analysis based on Metallothionein Gene Sequence of an Indigenous Species *Pisidium (Neopisidium) coreanum* in Korea**
Moon Ki Baek, Jun-Seo Lee, Se Won Kang, Jae Bong Lee, Hyun Jung Kang, Yong-Hun Jo, Mi-Young Noh, Yeon Soo Han, Sang-Haeng Choi, Sung-Hwa Chae, Hong-Seog Park, Jun-Sang Lee and Yong Seok Lee

161 **The Influence of Water Temperature and Salinity on Filtration Rates of the Hard Clam, *Gomphina veneriformis* (Bivalvia)**
Hyun Chool Shin, Jung Ho Lee, Hyo Jin Jeong, Jung Sick Lee, Jung Jun Park and Bae Hoon Kim

173 **Fisheries Biology of Bigfin Reef Squid, Sepioteuthis lessoniana in Jeju Island, Korea**
Hyunjung Kang, Yeonghye Kim, Eunhui Lee, Dongwoo Lee and Daesoo Chang

THE KOREAN JOURNAL OF MALACOLOGY

(Corée)
Vol 25, N° 3, décembre 2009

한국패류학회지

CONTENTS

179 **Water temperature and salinity tolerance of embryos and spat of the mussel, *Musculista senhousia***
Zhuo Liang Liang, Young Hun Kim, Zhi Feng Zhang, Sang Min Lim and Kyoung Ho Kan

189 **Age and Growth of Purple whelk, *Rapana venosa* (Gastropoda: Muricidae) in the West Sea of Korea**
Jong-duk Choi and Dong-Ki Ryu

197 **Genetic characteristics of Pacific abalone, *Haliotis discus hannai* in Dokdo Island Korea**
Choul-Ji Park, Jeong-Ho Lee, Jae Koo Noh, Hyun Chul Kim, Byoung Hwa Min and Jeong-In Myeong

203 **Optical properties and color analysis of various pearl shells**
Myung-Jin Lee, Weon-Sik Chae, Jin-Gyo Seo and Jong-Wan Park

211 **New Record of brackish water snail, *Iravadia (Fluviocingula) elegantula* (Sorbeoconcha: Iravadiidae), in Korea**
Jun-Sang Lee and Duk-Ki Min

213 **The study on bioaccumulation of heavy metals in the cultured Pacific oyster, *Crassostrea gigas*, along the coast of Tongyeong, Korea**
Sang-Man Cho, Yeong-Hwan Kim and Woo-Geon Jeong

223 **Molecular cloning and expression pattern of Metallothionein Gene from the left-handed shell, *Physa acuta***
Yong Hun Jo, Moon Ki Baek, Se Won Kang, Jae Bong Lee, Byun In-Seon, Sang-Haeng Choi, Sung-Hwa Chae, Jung-Ha Kang, Yeon Soo Han, Hong-Seog Park and Yong Seok Lee

231 **Biological environmental characteristics in habitats of an abalone *Haliotis diversicolor* in the eastern coast of Jeju-do, Korea**
Joon-Taek Yoo, Young-Min Choi, Moon-Ho Yang, Yang-Jae Im, Joon-Chul Ko4 and Dae-Soo Chang

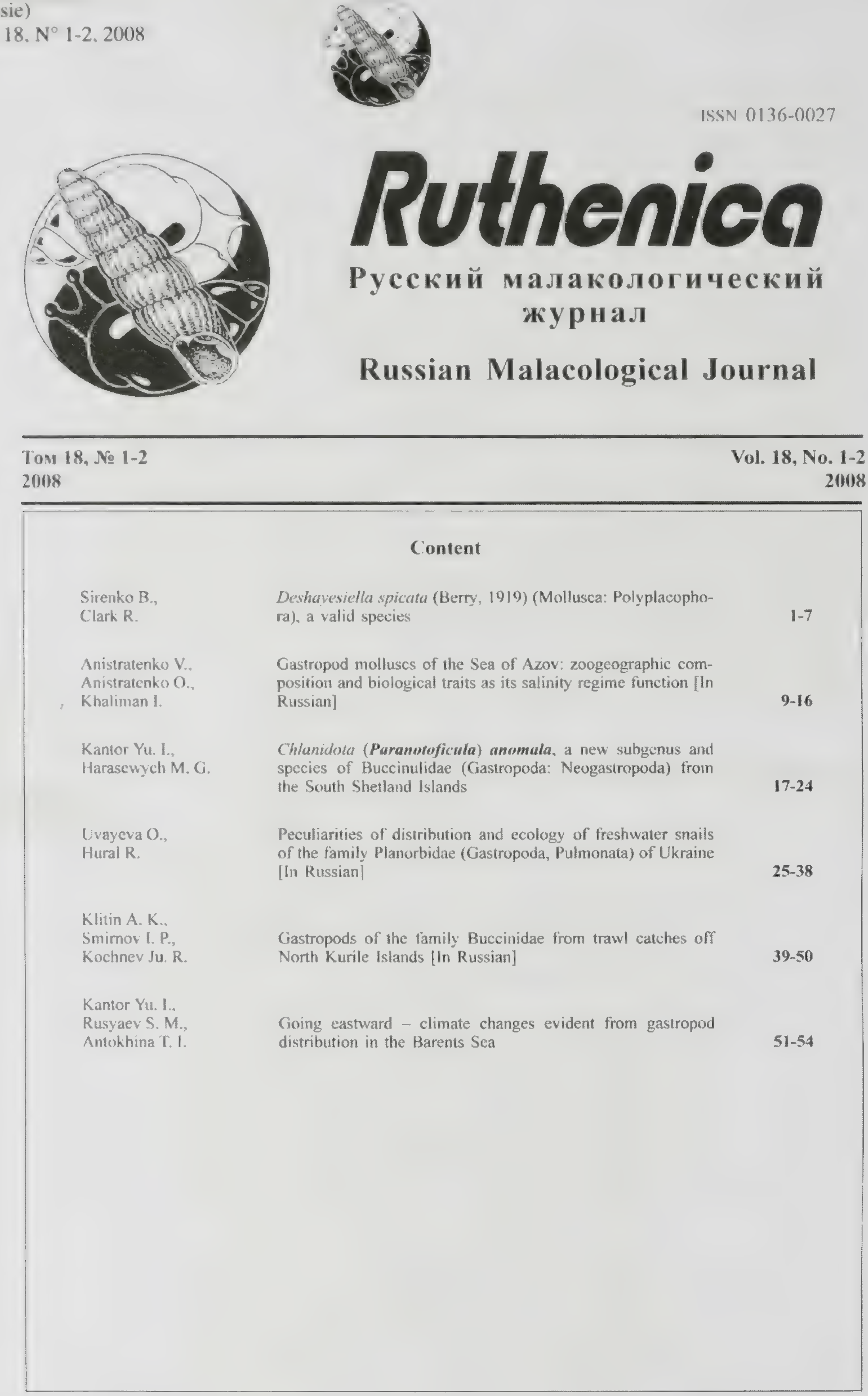
237 **Sakhalin-Kurile Species of Pearl Mussels (Bivalvia: Margaritiferidae) from Transbaikalye**
Olga K. Klishko

243 **Rediscovery of *Sinotaia quadrata* (Architaenioglossa: Viviparidae) of Kumpung Reservoir in the Jellabuk-do, Korea**
Jun-Sang Lee

[Pour les magazines ci-dessous: consulter Roland Houart]

Ruthenica

(Russie)
Vol. 18, N° 1-2, 2008



ISSN 0136-0027

Ruthenica
Русский малакологический журнал
Russian Malacological Journal

Том 18, № 1-2
2008

Vol. 18, No. 1-2
2008

Content

Sirenko B., Clark R. — *Deshayesiella spicata* (Berry, 1919) (Mollusca: Polyplacophora), a valid species 1-7

Anistratenko V., Anistratenko O., Khaliman I. — Gastropod molluscs of the Sea of Azov: zoogeographic composition and biological traits as its salinity regime function [In Russian] 9-16

Kantor Yu. I., Harasewych M. G. — *Chlanidota* (***Paranotoficula***) ***anomala***, a new subgenus and species of Buccinulidae (Gastropoda: Neogastropoda) from the South Shetland Islands 17-24

Uvayeva O., Hural R. — Peculiarities of distribution and ecology of freshwater snails of the family Planorbidae (Gastropoda, Pulmonata) of Ukraine [In Russian] 25-38

Klitin A. K., Smirnov I. P., Kochnev Ju. R. — Gastropods of the family Buccinidae from trawl catches off North Kurile Islands [In Russian] 39-50

Kantor Yu. I., Rusyaev S. M., Antokhina T. I. — Going eastward – climate changes evident from gastropod distribution in the Barents Sea 51-54

Ruthenica
(Russie)
Vol. 19, N° 1-2, 2009

Ruthenica

Русский малакологический журнал

Russian Malacological Journal

Том 19, № 1-2
2009

Vol. 19, No. 1-2
2009

Contents

Alexeyev D. O., Gornichnykh A. V.	New gastropod species *Buccinum* ***fraussenі*** sp. nov. (Gastropoda, Buccinidae), with comments on intraspecific structure of *Buccinum scalariforme* Beck in Møller, 1842 [In Russian]	1-18
Lutaenko K.A.	On the identity of "*Gari californica*" (Bivalvia: Psammobiidae) from the North-Western Pacific	19-26
Lutaenko K.A.	Finding of the bivalve mollusk *Cuspidaria* (*Nordoneaera*) *trosaetes* Dall, 1925 (Cuspidariidae) in Russian waters of the Sea of Okhotsk [In Russian]	27-30
Gural-Sverlova N.V., Martynov V.V.	First record of land molluscs of the genus *Elia* (Clausiliidae) on the territory of Ukraine [In Russian]	31-35
Klishko O.K.	Anodontine bivalves (Bivalvia, Anodontinae) from the refuge lake Arejskoe of Transbaikalia [In Russian]	37-52
Gural-Sverlova N. V., Balashov I. A., Gural R. I.	Recent distribution of terrestrial molluscs of the family Agriolimacidae on the territory of Ukraine [In Russian]	53-61
Thasun Amarasinghe A. A., Praneeth Jayamadu Alwis H. A., Madhava S. Botejue W., Krishnarajah S. R.	Three sympatric land snail species in an isolated islet of Rathgama Lagoon ecosystem of Sri Lanka	63-65
Kantor Yu. I.	On the forgotten species from the Russian Far-East seas, *Plicifusus olivaceus* Bartsch, 1929	67-72
Dgebuadze P. Yu., Kantor Yu.I.	On the finding of free-living population of parasitic gastropod *Amamibalcis yessoensis* in Peter the Great Bay (Japan Sea)	73-75

FERNAND & RIKA DE DONDER
Melsbroeksestraat 21
1800 Vilvoorde - Peutie
BELGIUM
Tel : +32 (0)2 253 99 54
Fax : +32 (0)2 252 37 15
e-mail : fernand.de.donder@pandora.be

WORLDWIDE SPECIMEN SHELLS

10 Minutes from Brussels Airport. Visitors welcome.

All Families from the very common to the ultra rare, specialized in Pectinidae, Philippine shells and European shells.

Free list on request, good quality shells at the best prices. Satisfaction guaranteed !

CONCHOLOGIST

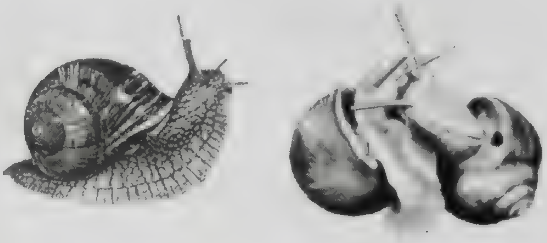
Calendar membership (Jan - Dec) = $25 (USA)
Postal surcharges: + $5 for USA first class,
Canada & Mexico + $5, other nations + $15
New members apply to Doris Underwood, Membership Director
698 Sheridan Woods Drive
W. Melbourne, FL 32904-3302
USA
dunderwood1@cfl.rr.com

Quarterly Journal of the Conchologists of America, Inc.

XENOPHORA
Bulletin de l'Association Française
de Conchyliologie

2010 Yearly subscription rate
France –Europe – DOM TOM : 50 €
Other countries : 60 €
Visit our site : www.xenophora.org

afc BP 307 F-75770 Paris Cedex 16



SOCIEDAD ESPAÑOLA
DE MALACOLOGIA
S.E.M.

Museo Nacional de Ciencias Naturales
José Gutiérrez Abascal, 2
28006 MADRID

SEM (Sociedad Española de Malacologia) is a scientic society devoted to the study of molluscs.

Every year the memberships receive the following publications:

2 issues of IBERUS
1 issue of RESEÑAS MALACOLOGICAS
2-3 issues of NOTICIARIO DE LA SEM

some years, 1 extra IBERUS from a Congress or as a supplement.

You can be membership of the SEM by 7.000 ptas by year, plus an unique inscription fee of 1.000 ptas.

Please, ask for the inscription print paper.

The Strandloper
BULLETIN OF THE CONCHOLOGICAL SOCIETY OF SOUTHERN AFRICA

The quarterly bulletin of the Conchological Society of Southern Africa contains reviews and discussion of Southern African marine and non-marine shells, and information about shell collecting in the region. Membership of the Society is US$25 per year.

Please contact
The Conchological Society of S.A.
7 Jan Booysen Str.
Annlin 0182 Pretoria
South Africa
or
email **mikec@msinfo.mintek.ac.za**

UN GANGSTEROPODE

Nederlandse
Malacologische
Vereniging

Dutch Malacological Society

Our society warmly welcomes new members (both from the Netherlands and abroad) to participate in our activities:

- **the journals (Basteria and Correspondentieblad)**
- **the meetings (usually 3-4 per year)**
- **the Internet website**
- **the library**
- **the collecting excursions**

Join us and meet new shelling friends. Further info: Bram Breure, Van Schagenplantsoen 8, NL-2741 EN Waddinxveen, The Netherlands. E-mail: abreure@xs4all.nl

Club Conchylia e.V.
German Shell Collector's Club

Our journals:

- Informationen
- Mitteilungen
- Acta Conchyliorum

Yearly subscription rate: 40.- €

Visit our site:
www.club-conchylia.de

Further informations:
Klaus Kittel
Sonnenrain 10
D-97859 Wiesthal
e-mail: klaus_kittel@hotmail.com

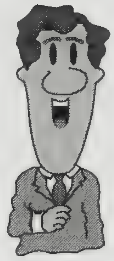
GLORIA MARIS

A magazine dedicated to the study of shells.

Edited by the Belgian Society for Conchology, organizers of the Belgium Shellshow

Subscription: Belgium: € 30 - The Netherlands: € 33
Other countries: € 40

Members account manager: J. Wuyts Koningsarendlaan 82 B 2100 Belgium
tel.: 32 3 324 99 14 e-mail: wuyts.jean@scarlet.be



Si vous passez commande chez l'un de nos annonceurs, n'oubliez pas de préciser que vous avez trouvé son annonce dans Novapex/Société !!!

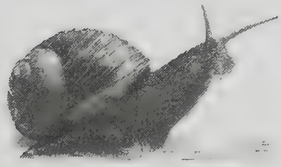
TRITON

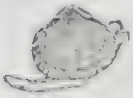
Journal of the Israel Malacological Society

ISSN 1565-1916
Published twice a year since 2000
Yearly subscription rate 20 €

Further information:
Eduard Heiman
e-mail: heimel@netvision.net.il

Keppel Bay Tidings
A quarterly magazine dedicated to the study of shells.
Edited by the Keppel Bay Shell Club Inc.
Subscription:- $20.00 Aus.
Apply to:- Keppel Bay Shell Club Inc.
P.O. Box 5166
Central Queensland Mail Centre, 4702
Queensland,Australia.





Grandes marées de l'année 2010

Christiane DELONGUEVILLE et Roland SCAILLET

Bonne nouvelle ! 2010 est un grand cru. Les plus grandes marées avec un coefficient de 116 auront lieu le 2 mars et le 10 septembre. Ne les ratez surtout pas ! D'autres marées de coefficient supérieur à 110 auront également lieu début février, fin mars, en octobre et même en pleines vacances à la mi-août. Bref de quoi satisfaire les amateurs de pêche à pied et d'observation de la faune de l'estran.

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Samedi 2	(99) - 101
	Dimanche 3	101 - 101
	Samedi 30	(97) - 103
	Dimanche 31	108 - 111
Février	Lundi 1	112 - 112
	Mardi 2	110 - 106
	Mercredi 3	101 - (94)
	Dimanche 28	102 - 108
Mars	Lundi 1	113 - 115
	Mardi 2	116 - 115
	Mercredi 3	113 - 108
	Jeudi 4	102 - (95)
	Lundi 29	101 - 106
	Mardi 30	110 - 112
	Mercredi 31	112 - 110
Avril	Jeudi 1	107 - 103
	Mercredi 28	(99) - 100
	Jeudi 29	100 - (99)
Mai	-	-
Juin	-	-
Juillet	Mardi 13	(98) - 101
	Mercredi 14	102 - 102
	Jeudi 15	100 - (98)
Août	Mardi 10	(98) - 103
	Mercredi 11	108 - 111
	Jeudi 12	112 - 111
	Vendredi 13	109 - 105
	Samedi 14	100 - (93)
Septembre	Mercredi 8	103 - 109
	Jeudi 9	113 - 115
	Vendredi 10	116 - 114
	Samedi 11	111- 106
Octobre	Jeudi 7	103 - 108
	Vendredi 8	111 - 112
	Samedi 9	111 - 109
	Dimanche 10	106 - 100
Novembre	Samedi 6	101 - 101
	Dimanche 7	101 - (99)
Décembre	-	-

Nous réitérons les conseils habituels : Remettez toujours les pierres déplacées en bon ordre. Observez, photographiez et n'échantillonnez que le strict nécessaire. Soyez prudents et renseignez-vous sur les heures des marées à l'endroit où vous vous trouvez. Bonnes marées !

REFERENCE :

Annuaire des Marées pour l'année 2010 - Ports de France - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) - *Paris - 257 p.*

Pointe de l'Arcouest (Côtes d'Armor)

Les données reprises dans cet article peuvent également se retrouver sur notre site Internet :

http://users.swing.be/sw216502/

MOLLUSKS
NOV
5527

NOVAPEX

MCZ
LIBRARY
HARVARD
UNIVERSITY

Trimestriel de la Société Belge de Malacologie
association sans but lucratif
Quarterly of the Belgian Malacological Society

VOL. 11 (4) 2010 10 DECEMBRE

SOMMAIRE

Articles originaux – Original articles

E. Rolán & R. Fernández-Garcés	The shouldered species of the Rissoininae (Mollusca: Rissooidea) in the Caribbean with the description of three new species	83
E. F. García	The genus *Cirsotrema* (Gastropoda: Epitoniidae) in the Panamic Province, with the description of two new species	93
B. Landau & G. Vermeij	A new species of *Plicopurpura* (Mollusca: Rapaninae) from the Lower Miocene Cantaure Formation of Venezuela	99
E. F. García	Description of four new species of *Cochlespira* (Gastropoda: Turridae) from the New World	107
S. Clavier, J.-P. Pointier & D. Massemin	Découverte de *Gundlachia radiata* (Guilding, 1828) (Mollusca: Planorbidae) en Guyane française	115
E. Rolán, R. Fernández-Garcés & H. G. Lee	A new species of *Mitromica* (Gastropoda: Costellariidae) from Nicaragua	119
B. Landau	A new species of *Malea* (Mollusca: Tonnoidea) from the Lower Miocene Cantaure Formation of Venezuela	123

Vie de la Société – Life of the Society

C. Vilvens	Prochaines activités	115

(suite du sommaire en dernière page de couverture)

ISSN 1375-7474

Périodique trimestriel
Bureau de dépôt
1370 Jodoigne

RÉGION WALLONNE

Publié avec l'aide du Ministère de la Région Wallonne

COTISATIONS / MEMBERSHIP 2010

Membres résidant en Belgique
(NOVAPEX et les numéros hors série)
Membre effectif..**40 €**

(sans le service du bulletin)
Personne appartenant à la famille d'un membre effectif et ayant même résidence.......... 15 €

Versement à effectuer à la Banque de la Poste, au n°000-0974225-54 de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret.

Abonnés résidant à l'étranger
(NOVAPEX et les numéros hors série)
Cotisation...**55 €**

Versement à effectuer auprès de la Banque de la Poste Belge, Bruxelles, au n° 000-0974225-54 [IBAN : BE42000097422554 - BIC : (= SWIFT) BPOTBEB1] de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret **ou** en versant **58 euros par Paypal** (contacter roland.houart@skynet.be auparavant) **ou** par mandat poste international, **EN EURO UNIQUEMENT**, au nom de M. Marc Alexandre, rue de la Libération, 45, B-6182 Souvret
(tous frais y afférents à payer lors de l'acquittement)

FOREIGN SUBSCRIBERS

(NOVAPEX and irregularly published supplements)
Single subscription.....................................**55 €**

Payable at Banque de la Poste Belge, Brussels, account nr 000-0974225-54, [IBAN: BE42000097422554, BIC: (= SWIFT) BPOTBEB1] of M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret, Belgium, **or** by International Money Order at same address **or 58 euros** with **Paypal** (contact roland.houart@skynet.be before). Payable **IN EURO ONLY**. (All bankcharges to be paid by customer)

Suivant un accord avec la **SIM** (Societa Italiana di Malacologia), nos membres **européens** qui souscrivent également à cette société pour 2010, peuvent payer leur(s) cotisation(s) **à la SBM** pour les deux sociétés. Les membres européens de la **SIM** peuvent faire de même chez eux.
*By common agreement with **SIM**, our **European** members that subscribe to that society for 2010 can pay **to the SBM** the membership fees for both societies. The European members of the **SIM** can do the same paying to their society.*

Dans ce cas, vous obtiendrez une réduction de 2 €pour la SIM et de 2 €pour la SBM, soit :
In this way you can have a discount of 2 €for the SIM and of 2 €for the SBM :
SIM (Bol. Malacologico + Notiziario SIM) €38,00
SBM (Novapex + Novapex/Société)...................€53,00
(Belgian members: €38,00)

Editeur responsable: C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye

PRESIDENT HONORAIRE (*Honorary President*) • M. R. DUCHAMPS, av. Mozart, 52, 1190 Bruxelles
VICE-PRESIDENT HONORAIRE (*Honorary Vice-President*) • M. E. WAIENGNIER, rue Camille Wollès, 42, 1030 Bruxelles

CONSEIL D'ADMINISTRATION

PRESIDENT • M. C. VILVENS, rue de Hermalle, 113, 4680 Oupeye 04/248.32.25
VICE- PRESIDENT & BIBLIOTHECAIRE (*Vice-president and Librarian*) • M. E. MEULEMAN, Sart 32, 4171 Poulseur 04/380 55 16
TRESORIER (*Treasurer*) • M. M. ALEXANDRE, rue de la Libération, 45, 6182 Souvret 071/46.12.88
SECRETAIRE (*Secretary*) • Mme A. LANGLEIT, av. Cicéron, 27, bte 92, 1140 Bruxelles 02/726.17.61
ADMINISTRATEUR (*NOVAPEX Manager*) • M. R. HOUART, St. Jobsstraat, 8, 3400 Landen (Ezemaal) 016/78.86.16

Internet : http://www.societe-belge-de-malacologie.be
e-mail : vilvens.claude@skynet.be **ou** e.meuleman@skynet.be

Les articles et textes présentés dans cette revue réflètent l'opinion personnelle de leur(s) auteur(s) et non pas nécessairement celle de la Société ou de l'éditeur responsable.
Tous droits de reproduction, de traduction et d'adaptation des articles publiés dans ce bulletin, réservés pour tous pays.
All rights of reproduction are reserved with the written permission of the board.

PUBLICATIONS PRECEDENTES/ FORMER PUBLICATIONS:
- Bulletin Mensuel d'Information (1966-1971)
- INFORMATIONS de la Société Belge de Malacologie (1972-1985)
- ARION (1986-1999)
- APEX (1986-1999)

SOCIETE BELGE DE MALACOLOGIE

The shouldered species of the Rissoininae (Mollusca: Rissooidea) in the Caribbean with the description of three new species

Emilio ROLÁN
Museo de Historia Natural, Campus Universitario Sur,
15782 Santiago de Compostela, Spain

Raúl FERNÁNDEZ-GARCÉS
Centro de Estudios Ambientales de Cienfuegos (CEAC),
División de Gestión Ambiental,
calle 17, esquina Ave. 46, Cienfuegos, Cuba

KEYWORDS. Rissooidea, Rissoininae, *Rissoina*, *Schwartziella*, new species, Cuba, Yucatán, Nicaragua.

PALABRAS CLAVE. Rissooidea, Rissoininae, *Rissoina*, *Schwartziella*, especies nuevas, Cuba, Yucatán, Nicaragua.

ABSTRACT. The Caribbean species of Rissoininae which have a shoulder on the subsutural part of the whorls are studied. New information on some already known species is reported, and three new species are described as new and compared with the ones that are morphologically close.

RESUMEN. Se estudian las especies de Rissoininae del Caribe que tienen un hombro en la porción subsutural de las vueltas. Se aporta información sobre algunas especies ya conocidas y se describen tres nuevas especies, que se comparan con las morfológicamente más próximas.

INTRODUCTION

The species of the superfamily Rissooidea Gray, 1847 occur in radiations in several biogeographical provinces. Likewise the subfamily Rissoininae Stimpson, 1865 exhibits diversification in many geographical areas. In the eastern Atlantic the group is very important as exemplified in the Cape Verde Archipelago with 29 species (Rolán & Luque, 2000).

In the Caribbean, the species of the subfamily are comparably numerous with 23 species recorded from Cuba in Espinosa et al. (1995). In recent years new species have been named: two in De Jong & Coomans (1988), one in Rolán (1998), four in Espinosa & Ortea (2002), one in Rolán & Fernandez-Garcés (2009a), one in Rolán, Fernandez-Garcés & Lee (2009), and taxonomic reviews have been published such as Rolán & Fernandez-Garcés (2009b).

In the present work, we study those species of the subfamily which have shouldered whorls, an easily distinguished salient quite possibly without phylogenetic significance.

The material examined was collected by the junior author (RFG) diving and dredging in Cuba during many collecting trips spanning a long period of time, and also by the first author (ER) in some trips to Cuba (in 1978, 1984, 1990, 2008). Other samples were obtained by the first author during a trip to Yucatan (Mexico) in 1994 and January 1997 on a research expedition to study the marine biodiversity of the Miskitos Archipelago (Nicaragua) organized by the Universidad Autónoma of Madrid.

The material from these collections along with museum material, principally from Cuba, possessing a subsutural shoulder are studied and described in detail. Some species new to science are named in the present work.

Abbreviations

MNCN: Museo Nacional de Ciencias Naturales, Madrid
MNHN: Museum national d'Histoire naturelle, Paris
MHNS: Museo de Historia Natural, Santiago de Compostela
BMNH: Natural History Museum, London
IES: Instituto de Ecología y Sistemática, La Habana
IdO: Instituto de Oceanología, La Habana
CFG: Collection Fernández-Garcés, Cientuegos
CHL: Collection Harry G. Lee, Florida
SEM: Scanning Electron Micrograph

SYSTEMATICS

Superfamily **RISSOOIDEA** Gray, 1847
Family **RISSOIDAE** Gray, 1847
Subfamily **RISSOININAE** Stimpson, 1865
Genus ***Schwartziella*** Nevill, 1884

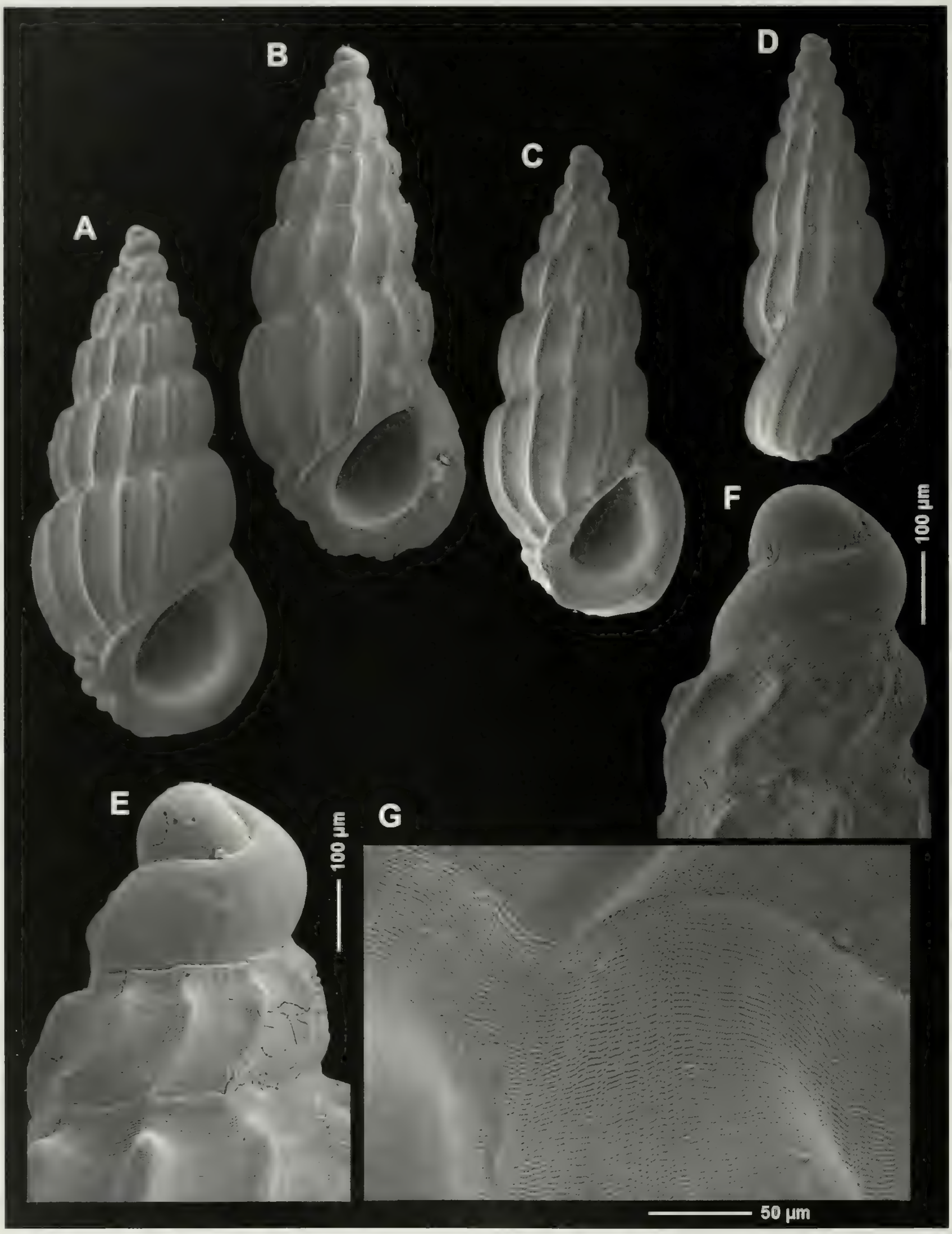


Figure 1

A-D. *Schwartziella fischeri* (Desjardin, 1949); **A.** Neotype, 3.5 mm, Cuba (MNHN); **B.** Shell, 3.5 mm, María la Gorda, Cuba (MHNS); **C-D.** Shells, 3.3, 3.1 mm, Tobago (CHL); **E-F.** Protoconchs; **G.** Microsculpture.

Schwartziella fischeri (Desjardin, 1949)
Figs 1A-G

Type material. The type material, supposedly in the MNHN was not found (Virginie Héros, pers. comm.). As the separation of these species is based in minor details we have designated a neotype (Fig. 1A) which is deposited in MNHN (catalogue number MNHN 23016).

Other material examined. Several hundred shells from Cuba: Canarreos, María la Gorda, Cienfuegos Bay, etc.

Description. Shell (Figs 1A-D), see Desjardin (1949). The mention of 8 whorls in the original description is based in counting from the beginning of the protoconch, not in the Verduin (1977: 92) method. It is important to point out the mention of a funicule near the base derived from an inflexion of the axial ribs. The protoconch (Figs 1E-F) has about 1.2 whorls and a diameter between 240-280 μm. The microsculpture (Fig. 1G) is minute and covers all the entire shell.

Distribution. Desjardin (1949) described this species from Cuba, Vokes & Vokes (1983) from Mexico, and Redfern (2001) from Bahamas and in the CHL there are shells from Tobago. The records of De Jong & Coomans (1988) from ABC Islands, Leal (1991) from Trindade, and Rios (1994) from Brazil, are dubious since the shells shown do not conform to that of the original description.

Schwartziella vanpeli De Jong & Coomans, 1988
Figs 2A-B

Rissoina vanpeli De Jong & Coomans, 1988: 25, pl. 1, fig. 108.

Type material. Holotype in ZMA (3.87.0.56) 3.8 mm.

Other material examined. About 60 shells from Cienfuegos, Cuba (MHNS, CFG).

Description. See De Jong & Coomans (1988). We can now add information on the protoconch (Fig. 2B): 310 μm in diameter, one whorl and 4 spiral cords.

Distribution. Curaçao and Aruba in the original description. Leal (1991) from Vitória Seamount and Abrolhos Reef Complex. We have material from Cuba.

Remarks. The species was figured only by drawings in the original description (De Jong & Coomans, 1988), and later, Leal (1991) showed SEMs of the shell and protoconch. We agree with this information and we also present photographs of the shell (Fig. 2A) and protoconch (Fig. 2B), showing that the presence of spiral threads. The only "Caribbean" species with a stepped profile previously reported was *Schwartziella turricula* Pease, 1861, but this is a Pacific species (represented in Leal, 1991), and its occurrence in the Caribbean is probably erroneous based on misidentification.

Schwartziella abacocubensis
Espinosa & Ortea, 2002
Figs 2C-E

Schwartziella abacocubensis Espinosa & Ortea, 2002. *Avicennia*, 15: 143, Figs 1D.

Type material. Holotype in IdO (represented in Espinosa & Ortea (2002). Paratype in CFG (Fig. 2C).

Other material examined. About 15 shells from Guanahacabibes (MHNS).

Description. Shell (Fig. 2C): see Espinosa & Ortea (2002). In the original description this species is shown only by two poor quality photographs, and it is mentioned that the protoconch has 1¼-1½ whorls. We have examined material from Cuba. The protoconch (Fig. 2D) is smooth, with a diameter of about 350 μm. The microsculpture of the teleoconch (Fig. 2E) is similar what is found in other species. The holotype measures 4.0 mm. Our material is comprised of slightly smaller shells (3.6-3.9 mm).

Distribution. Only known from Cuba and Bahamas (Redfern, 2001).

Remarks. This species is very similar to *S. vanpeli*, but the latter has obvious spiral cords on the protoconch. It is somewhat similar to *S. fischeri*, but the latter has a nodulous spiral cord near the base.

Schwartziella luisalvarezi spec. nov.
Figs 3A-F

Type material. Holotype (Fig. 3A) in the MNCN (15.05/53580). Paratypes in the following collections: MNHN (1, Fig. 3B), MHNS (5), CFG (1).

Other material studied. 2 s, 5 juveniles, Cayo Witties, Nicaragua (MHNS).

Type locality. Puerto Morelos, Yucatán, Mexico, 20 m.

Etymology. The species is named for Luis Álvarez Estévez, nephew of the first author.

Description. Shell (Figs 3A-C) small, oval-conic, solid, whitish. Protoconch (Fig. 3D) with ¾ of whorl beginning with a broad nucleus (150 μm) with a total diameter of about 270 μm. Under high magnification a coarse microsculpture of numerous micro depressions can be seen (Fig. 3E). Teleoconch between 4 and 4 ½

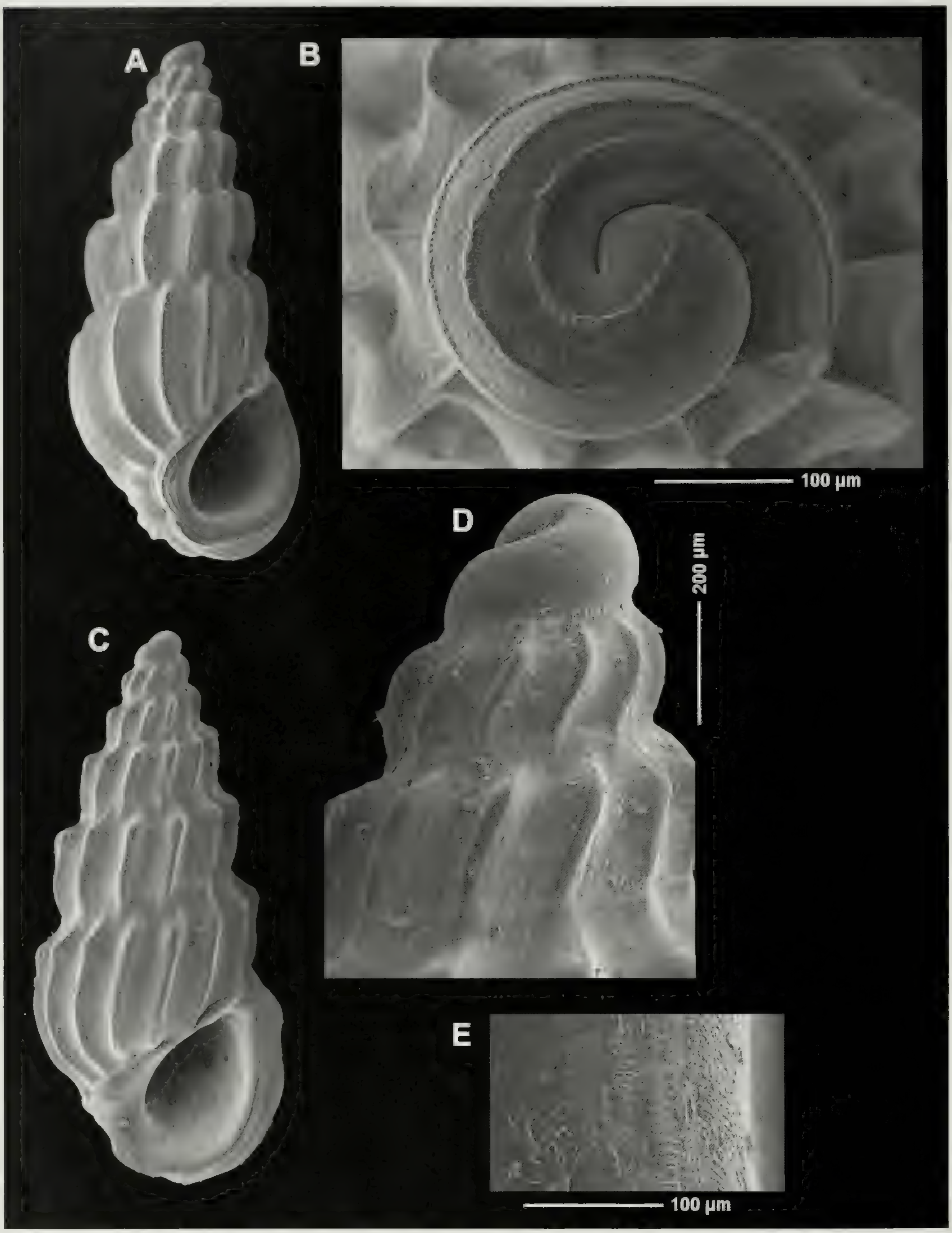


Figure 2

A-B. *Schwartziella vanpeli* De Jong & Coomans, 1988. **A.** Shell, 3.3 mm, Cienfuegos, Cuba (MHNS). **B.** Protoconch; **C-E.** *Schwartziella abacocubensis* Espinosa & Ortea, 2002; **C.** Paratype, 3.6 mm, Maria la Gorda (CFG); **D.** Protoconch; **E.** Microsculpture.

whorls, with prominent and undulating sharp axial ribs which form a subsutural shoulder. They number 9 on the first whorl, 12 on the two subsequent and 12-13 on the last whorl. Near the base there is a little thickening of the ribs. The suture is slightly undulating as it passes over the ribs of the previous whorl. Aperture slightly ovoid, the labrum with numerous parallel lines and reinforced border. Dimensions: the holotype is 2.5 mm long; other shells can be slightly larger but never reaching 3 mm.

Distribution. Only known from Yucatán, Mexico and Nicaragua.

Remarks. The new species must be distinguished from those morphologically most similar:
Schwartziella abacocubensis Espinosa & Ortea, 2002, is slightly larger (usually 3.3-4.2 mm), the axial ribs are lightly thickened on their upper aspects, the shoulder being angulous and not rounded. Furthermore, the spiral striae on the last whorl in *S. abacocubensis* number about 14 per 100 microns, while in the new species there may be up to 50 striae in the same space.
S. fischeri and *S. vanpeli* are larger, their protoconchs have one whorl or more, and the latter species has spiral cords.

Schwartziella bryerea (Montagu, 1803)
Figs 4A-F

Turbo bryereus Montagu, 1803: 313-314, pl. 15, fig. 8as.
Rissoa subangulata C. B. Adams, 1850.
Rissoina decipiens E. A. Smith, 1890.
Rissoina bermudensis Peile, 1926.
Rissoina michaudi Desjardin, 1949.

Type material. The lectotype is in the Exeter Museum (63/1976/4223) (Fig. 4C). It is the type of *Schwartziella* Nevill, 1884 (monotypy).

Type locality. Weymouth [In error]. It is a species of the Caribbean Province.

Description. Shell (Figs 4A-F): see Montagu (1803), Schwartz (1870) and Desjardin (1949). We would only like to point out that the whorls are slightly convex, the suture not very evident; axial ribs are numerous, slightly opisthocline, and approximately as wide as their interspaces.

Distribution. Most of the literature on the Caribbean malacofauna indicates a wide distribution in that Province and a little to the north.

Remarks. The original figure from Montagu (1803) (Fig. 4A) shows a shell minimally convex whorls, shallow sutures, and with an inconspicuous protoconch (which might be broken). The lectotype (Fig. 4C) shows a similar shell. Also, in Desjardin (1949: pl. 1, fig. 2) (Fig. 4B) the shell shown presents this morphology, as well as *Rissoina chesneli var. Michaudi* (Fig. 4D), considered a synonym. Desjardin cites the figure of Schwartz (1870: 72) as representative. Also the figure of Perry & Schwengel (1955: fig. 177) has this morphology (protoconch may be lost, slight convexity), but the number of the axial ribs is slightly smaller than in the previously figured shells. Similar are the shell shown in Warmke & Abbott (1961: pl. 10, fig. M) and that figured by Morris (1973: pl. 39, fig 1). All these figures depict a shell like the original figure without any shoulder, very different from some of modern representations (see under the following taxon).
The present species does not have shouldered whorls, and is mentioned here simply because of its similarity with the following species.

Schwartziella yoguii spec. nov.
Figs 4G-K

Schwartziella bryerea (Montagu, 1803) in De Jong & Coomans, 1988: 100.
Schwartziella bryerea (Montagu, 1803) in Redfern (2001).

Type material. Holotype (Fig. 4G) in MNCN (15.05/53581); paratypes in the following collections: MNHN (1, Fig. 4J), CFG (3, Fig. 4H), MHNS (1); IES (1).

Type locality. Cienfuegos, Cuba.

Etymology. After Israel González Durán (El Yogui), diving instructor from the Hotel Rancho Luna, for his many contributions supplying specimens and sediments.

Description. Shell (Figs 4G-H) ovoid elongate, solid, with stepped whorls. Protoconch (Figs 4I-J) very characteristic, almost cylindrical with 2¼ smooth whorls, a small nucleus measuring 50 μm, and a maximum diameter of about 300 μm. Teleoconch of about six whorls which increase rapidly, each with a marked subsutural convexity below which the shell is nearly straight. The axial sculpture is formed by opisthocline ribs which are narrow, the interspaces 4-5 times the width of the ribs. Aperture slightly ovoid, with a thickening labrum and columella. Dimensions: the holotype is 4.3 mm long, but some paratypes are larger (up to 5.8 mm).

Distribution. The species is known from ABC Islands (De Jong & Coomans, 1988, as *S. bryerea*), Bahamas (Redfern, 2001, as *S. bryerea*), and Cuba.

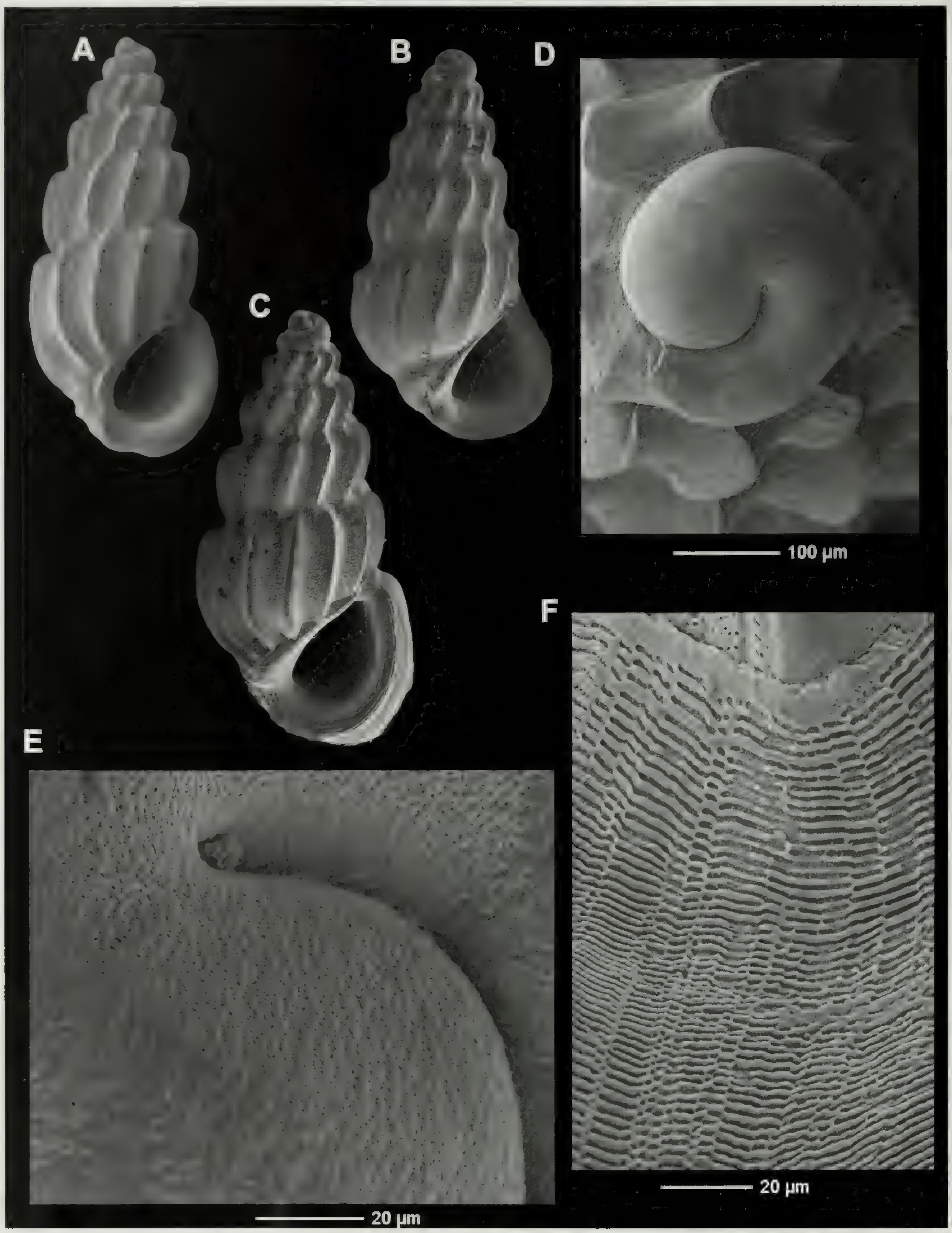


Figure 3

A-F. *Schwartziella luisalvarezi* spec. nov. **A.** Holotype, 2.5 mm, Puerto Morelos, Yucatán (MNCN); **B.** Paratype, 2.4 mm (MNHN); **C.** Paratype, 2.9 mm (MHNS); **D.** Protoconch; **E.** Microsculpture of the protoconch; **F.** Microsculpture of the teleoconch.

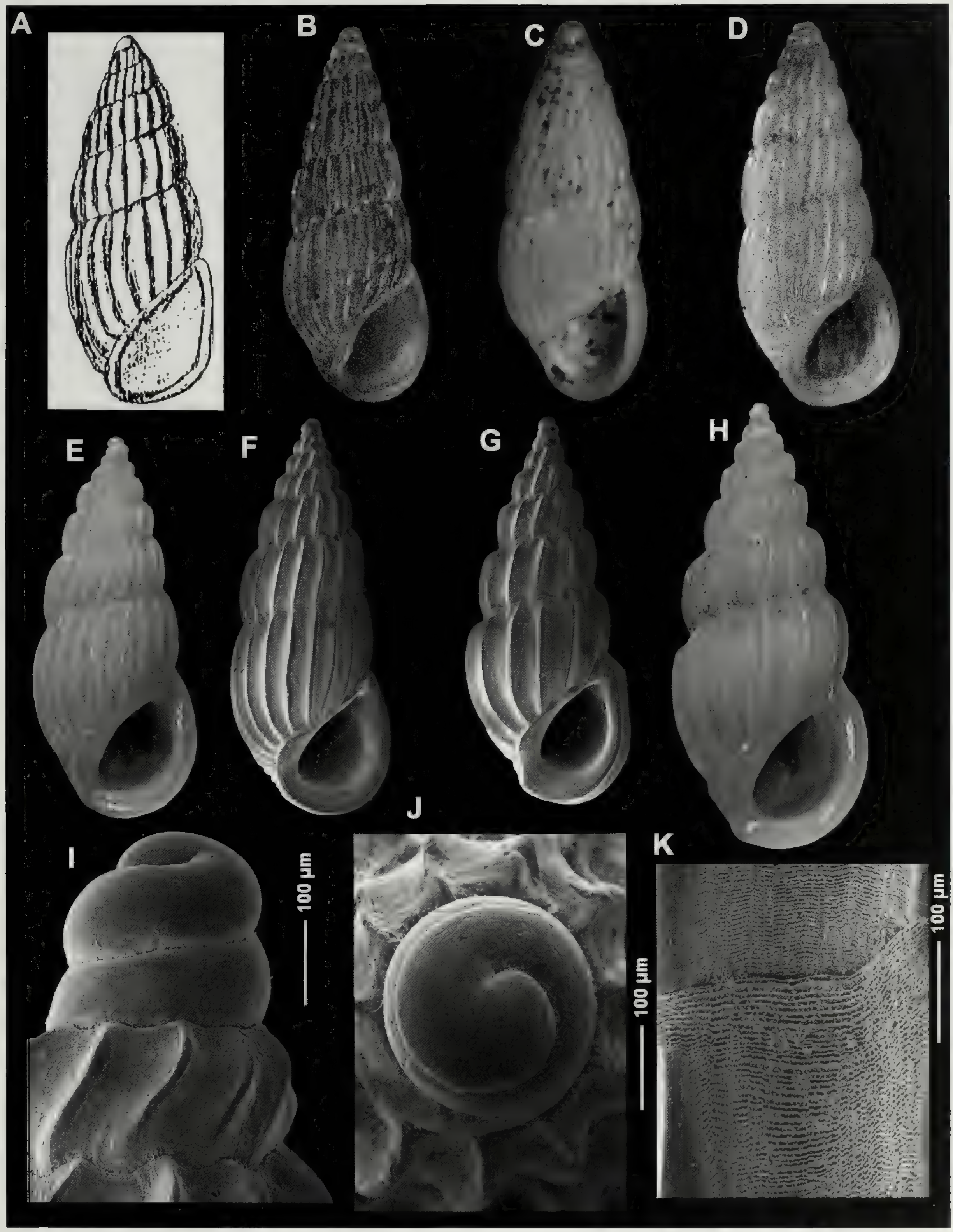


Figure 4

A-F. *Schwartziella bryerea* (Montagu, 1803); **A.** Original figure; **B.** in Desjardin (1949), approx. 2.8 mm; **C.** Lectotype, 4.7 mm, Exeter Museum (EXEMS:63/1976/4223) (photographed by Dave Bolton); **D.** *Rissoina chesneli var. Michaudi* in Desjardin (1949), considered a synonym of *S. bryerea*, 4.9 mm; **E-F.** shells, *S.* cf. *bryerea*, 4.6 mm, Cienfuegos (CFG) (MHNS); **G-K.** *Schwartziella yoguii* spec. nov. **G.** Holotype, 4.3 mm, Cienfuegos, Cuba (MNCN); **H.** Paratype, 5.7 mm (CFG); **I-J.** Protoconch; **K.** Microsculpture.

Remarks. This species has been considered by some authors to be *S. bryerea* (De Jong & Coomans, 1988, pl. 11, Figs 100) and Redfern (2001, Figs 147A-D). However, it may be distinguished by having fewer, narrower axial ribs and a distinct subsutural step.

Genus ***Rissoina*** d'Orbigny, 1840

Rissoina nicaobesa spec. nov.
Figs 5A-F

Type material. Holotype (Fig. 5A) in the MNCN (15.05/53579).

Other material examined. 3 immature shells and 5 juveniles, all from the type locality.

Type locality. Cayo Los Muertos, Miskitos Archipelago, Nicaragua, 30 m.

Etymology. The specific name is a combination of two words "nica", diminutive of Nicaragua, and "obesa", referring to the width of the shell.

Description. Shell (Fig. 5A) small, oval-conic, wide, solid, whitish. Protoconch (Figs 5B-D) with a diameter of about 330 µm and a little more than one whorl after the nucleus (which is about 130 µm in diameter). In juvenile shells (Figs 5C-E), a rough irregular nodulous surface can be observed. Teleoconch with about 6 whorls, the first few not stepped but in the later ones a subsutural step is quite evident. In the early whorls axial ribs are a little opisthocline, narrow, and about 10-12 per whorl. On the later ones, the axial ribs are orthocline, narrower than interspaces, and number about 21-22. The suture is slightly undulating as they pass over the ribs of the previous whorl. Aperture ovoid, with a strongly thickened lip, increased on the columella and parietal wall. A depression of the apertural border near the base confirms that this species is in the genus *Rissoina*.
Dimensions: the holotype is 4.0 mm.

Distribution. Only known from Nicaragua.

Remarks. No other Caribbean species may be confused with this species due to its broad profile, large last whorl, rough protoconch and stepped profile.

ACKNOWLEDGEMENTS

The authors thank to Jesús Méndez of the Centro de Apoyo Científico y Tecnológico a la Investigación (CACTI) for the SEMs; Jacques Pelorce for the material collected in his trips in the Caribbean; Dave Bolton of the Exeter Museum for photographing the lectotype of *Rissoina bryerea*. António Monteiro for the English correction of the manuscript. Harry G. Lee for his critical reading of the paper, and for his changes and suggestions.

REFERENCES

De Jong, K. M. & Coomans, H. E. 1988. *Marine gastropods from Curaçao, Aruba & Bonaire*. E. J. Brill, Leiden. 261 pp.

Desjardin, M. 1949. Les rissoina de l'ile de Cuba. *Journal de Conchyliologie*, 89(4): 193-208, pls. 9-10.

Espinosa, J. & Ortea, J. 2002. Descripción de cuatro nuevas especies de la familia Rissoinidae (Mollusca, Gastropoda). *Avicennia*, 15: 141-146.

Espinosa, J., Fernández-Garcés, & Rolán, E. 1995. Catálogo actualizado de los moluscos marinos actuales de Cuba. *Reseñas Malacológicas*, 9: 1-90.

Leal, J. H. 1991. *Marine Prosobranch Gastropods from Oceanic Islands off Brazil*. Backhuys, Oegstgeest. 418 pp.

Montagu, G. 1803. *Testacea Britanica: or an account of all the shells hitherto discovered in Britain*. London, 606 pp, 16 pls.

Morris, P. A. 1973. *A field guide to shells of the Atlantic and Gulf coasts and the West Indies*. Houghton Mifflin Company, Boston. 333 pp, 76 pls.

Perry, L. M. & Schwengel, J. S. 1955. *Marine shells of the Western coast of Florida*. Paleontological Research Institution, Ithaca, New York. 318 pp.

Rolán, E. & Fernández-Garcés, R. 2009a. Description of a new species of *Rissoina* (Prosobranchia, Rissoidae) from Bermuda. *Gloria Maris*, 48(1): 17-21.

Rolán, E. & Fernández-Garcés, R. 2009b. New information on Cuban *Rissoina* (Mollusca: Rissoidae) 1. *Rissoina fenestrata* and *R. vanderspoeli*. *Novapex*, 10(2): 59-64.

Rolán, E. & Luque, A. A. 2000. The subfamily Rissoininae (Mollusca: Gastropoda: Rissoidae) in the Cape Verde Archipelago (West Africa). *Iberus*, 18(1): 21-94.

Rolán, E. 1998. A new species of *Zebina* (Mollusca: Rissoidae: Rissoininae) from Yucatán (Mexico). *Apex*, 13(4): 177-179.

Rolán, E., Fernandez-Garcés, R. & Lee, H. G. 2009. The genus *Stosicia* in the Caribbean (Caenogastropoda, Rissoidae) with the description of a new species. *Basteria*, 73(1-3): 1-8.

Schwartz von Mohrenstern, G. 1870. Über die familie der Rissoiden und inbesondere die gattung *Rissoina*. 118 p., 11 pls.

Verduin, A. 1977. On a remarkable dimorphism of the apices of sympatric closely-related marine gastropod species. *Basteria*, 41(5-6): 91-95.

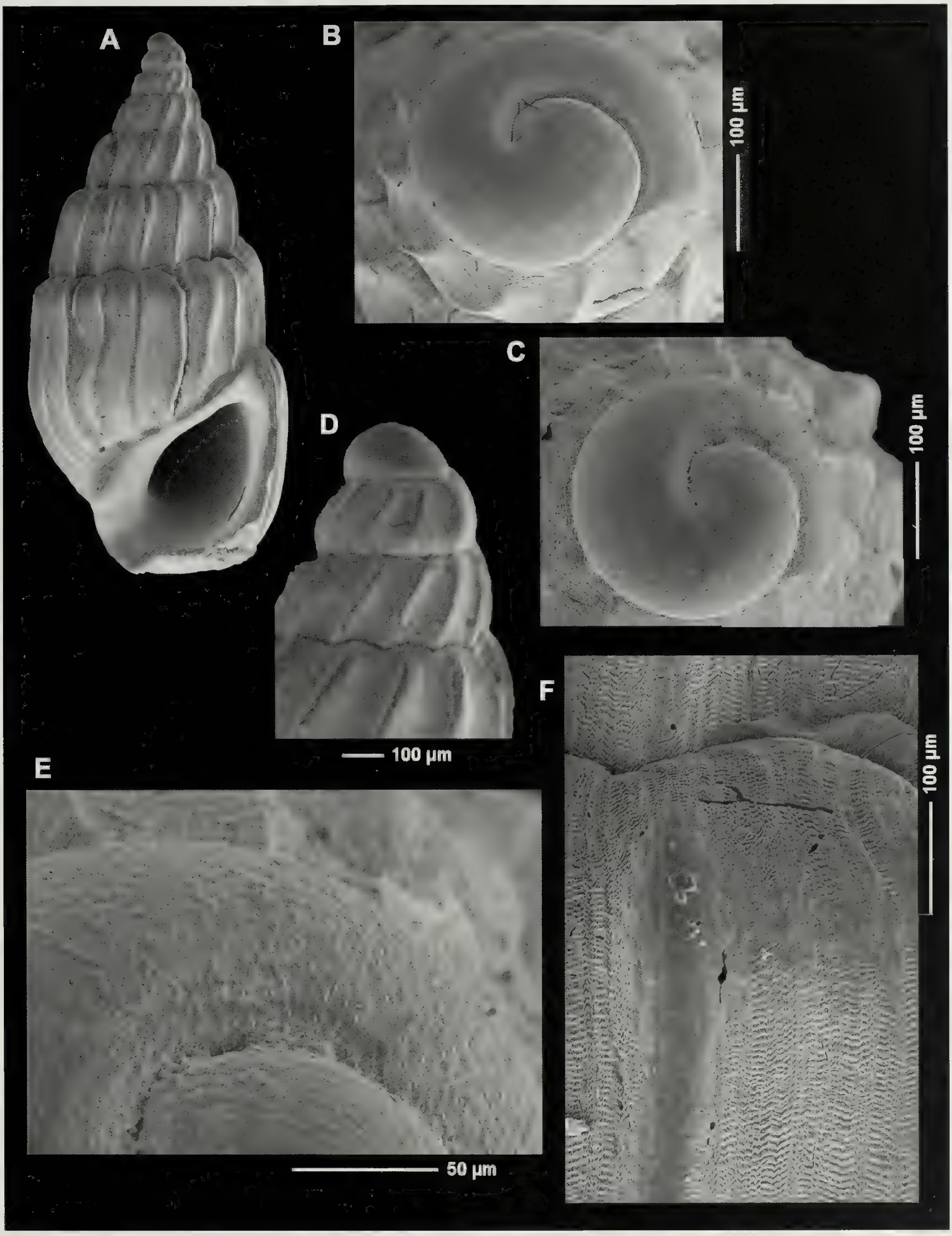

A
B
100 µm
C
100 µm
D
100 µm
E
50 µm
F
100 µm

Figure 5

A-F. *Rissoina nicaobesa* spec. nov. **A.** Holotype, 4.0 mm, Los Muertos, Nicaragua (MNCN): **B-D.** Protococonch; **B.** From the holotype; **C.** From a juvenile; **D.** Apex of the holotype; **E.** Microsculpture of the protoconch of fig. C; **F.** Microsculpture of the teleoconch.

The genus *Cirsotrema* (Gastropoda: Epitoniidae) in the Panamic Province, with the description of two new species

Emilio Fabián García
115 oak Crest Dr.
Lafayette, LA 70503, USA

KEY WORDS. Gastropoda, Epitoniidae, *Cirsotrema*, Panamic Province, Mexico, Costa Rica, Panama, Galapagos, new species.

ABSTRACT. Three species of *Cirsotrema* from the Panamic Province are recognized; two new species are described. *Cirsotrema togatum* Hertlein & Strong, 1951, traditionally treated as a single species complex, is separated into three distinct, sympatric species: *C. togatum*, *C. hertzae* n.sp, and *C. skoglundae* n.sp.

INTRODUCTION

Although the molluscan fauna of the Panamic Province has been extensively treated by Keen, its great extension, from Magdalena Bay, Gulf of California to Punta Aguja, Peru (Keen, 1971: 4), allows one to assume that many discoveries are still to be made, particularly since relatively little has been done in terms of formal exploration in the last decades. Until recently there has been a paucity of material of the genus *Cirsotrema* available in research institutions. Presumably, this is why the two new species described herein, formerly considered variations of *Cirsotrema togatum* Hertlein & Strong, 1951, have been overlooked.

The two earliest images of *Cirsotrema togatum* available in literature, other than the holotype, are a paratype from Costa Rica figured by Hertlein & Strong (1951:89, fig. 5), and a specimen from Panama figured by Olsson (1971:77, fig.77). These images are consistent with the original description and with the image of the holotype; however, a voucher specimen of C. "togatum", CAS 06518, is referable to *C. hertzae* n.sp, (Skoglund & Hertz, 2010: 24) described herein. Moreover, the important publication by DuShane (1974) on the Panamic-Galapagan Epitoniidae depicts as *C. togatum* images of two distinct species, *C. togatum* (pp. 34-35, fig. 55) and *C. hertzae* (pp. 34-35, fig.54); and her "Diagnosis" of *C. togatum* (p. 48) includes characters of the new species that were not established by Hertlein & Strong.

In 2009 Carol Skoglund and Carole Hertz contacted me regarding a dilemma they had encountered concerning three "forms" of *Cirsotrema togatum*. Mrs. Skoglund and her husband, the late Paul Skoglund, had been collecting mollusks in the Panamic Province for many years, and had amassed an extensive and important collection of shells from the region. The genus *Cirsotrema* was very well represented, and there were examples of the three species treated in this paper. Skoglund and Hertz expanded their research to cover a number of museums and private collections, particularly the important Epitoniidae collection housed at the Santa Barbara Museum of Natural History, which included specimens from the DuShane, Koch, Poorman, Shasky and Shy collections. Their "preliminary" researched study (2010) induced me to write this paper.

After publishing their study, Mrs. Skoglund donated her collection to the Santa Barbara Museum of Natural History, adding 25 specimens of *Cirsotrema* spp. to the museum's collection. In turn, the museum has allowed me to examine all of its *Cirsotrema* holdings from the Panamic Province.

All three species studied here inhabit most of the Panamic Province, from the Gulf of California to Panama. The three species live sympatrically at Bahía de los Angeles, Gulf of California, and *Cirsotrema hertzae* and *C. skoglundae* have been dredged together at Islas Secas, Bahía de Chiriquí, Panama.

I am honored to describe the two new species for Carol Skoglund and Carole Hertz, both of whom have worked indefatigably for decades to have a better understanding of the mollusca of the Panamic Province.

Abbreviations

CAS: California Academy of Sciences, San Francisco, USA.
CH: Carole Hertz collection, San Diego, California, USA.
KK: Kirstie Kaiser collection, Puerto Vallarta, Mexico.
LACM: Los Angeles County Museum, Los Angeles, California, USA.
LM: Lauretta Marr collection, Johnson City, Tennessee, USA.
EFG: author's collection
SBMNH: Santa Barbara Museum of Natural History, Santa Barbara, California, USA.
USNM: United States National Museum, Washington, D.C., USA
dd: empty shell
lv: live mollusk
spec: specimen

SYSTEMATICS

Family **EPITONIIDAE** S. S. Berry, 1910
Genus ***Cirsotrema*** Mörch, 1852
Type species: *Scalaria varicosa* Lamarck, 1812, by original designation.

Key to Panamic Province *Cirsotrema*

A. Axial interspaces clearly visible	*C. togatum*
Axial interspaces not visible	B
B. Shell profile strongly tabulated	*C. skoglundae*
Shell profile not tabulated	*C. hertzae*

Cirsotrema togatum
Hertlein & Strong, 1951
Figs 1-5, 17

Type material. Holotype (Fig. 1) length 37.5 mm, width 13.8 mm; CAS 065015. Paratype (Fig. 2) 14 mi. SE of Punta Judas. Costa Rica, 9°19'32"N, 84°29'30"W, 76-112 m, CAS 065516.

Type locality. MEXICO: Gorda Banks, Golfo de California, Baja California Sur, 23°1'N, 109°27'30"W; 91 m.

Material examined. MEXICO: Bahía de los Angeles, Baja California Norte, 28°05'N, 113°31'W, 22-38 m, 1 dd, SBMNH 423135. S. of Tetas de Cabra, Sonora State, 27°56'12"N, 111°04'15"W, 50-100 m; 4 lv, 2 dd, SBMNH 423137. SE of Punta San Antonio, Sonora State, 27°54'N, 111°04'32"W, 60-90 m, 1 dd, SBMNH 149423. Islas Ballenas, Ballenas Channel, Baja California Sur, 26°55'N, 113°09'30"W, 238-366 m, 1 lv, SBMNH 129029. Isla Danzante, Baja California Sur, 25°45'27"N, 111°14'36"W, 45-75 m, SBMNH 149425. Isla Danzante, Baja California Sur, 25°45'27"N, 111°14'36"W, 45-75 m, 4 dd, SBMNH 149422. NE of Isla Danzante, Baja California Sur, 25°45'N, 111°14'W, 91- 122 m, 1 dd, SBMNH 87382. Punta Coyote, Baja Califonia Sur, 24°21'N, 110°16'W, 30-45 m, 1 dd, SBMNH 87381. Los Frailes, Baja California Sur, 23°22'N, 109°24'W, 45-60 m, 2 lv, SBMNH 87383. **ECUADOR:** Black Beach, Isla Floreana, Islas Galápagos, 1°16'S, 90°29'W; 10-25 m, 1 dd, SBMNH 423140. Isla Santa Fe, Islas Galápagos, 0° 49'S, 90° o4'W, 50 m, 1 dd, SBMNH 423136.

Other material. MEXICO; Bahía Tenacatita, Jalisco State,19°17'N, 104°50'W; 37-73 m; 1 spec.; LACM 38-7.28. (Skoglund & Hertz, 2010)

Distribution. From Bahía de los Angeles, Baja California Norte, Mexico, to Panama Bay; Islas Galápagos.

Remarks. The species was described by Hertlein & Strong (1951: 89) as having "narrowly tabulated" whorl, 20 axial ribs on last whorl of the 10- whorl holotype, "of which every fourth, fifth or sixth is swollen to form a varix", and with a spiral sculpture of 7 cords in the interspaces between the axial ribs". The basal cord is highly ornamented, as it is composed of the widening of the primary axial elements, and in some cases only adjacent to each other (SBMNH 423137). These characters readily separate *C. togatum* from the other two Panamic *Cirsotrema* described herein: *C. hertzae* n.sp (Figs 6-10, 18) does not have tabulated whorls, and has a different ornamentation, and *C. skoglundae* n. sp. (Figs 11-14, 19) has widely tabulated whorls, similar to those of the western Atlantic species *C. dalli* Rehder, 1945 (Figs 15-16).The largest specimen of *C. togatum* I examined measures 37.7 mm and has 7.5 whorls, with several earlier whorls missing (SBMNH 423139**).**

Cirsotrema togatum is not an uncommon species in the Gulf of California; however, it is rarely collected south of Mexico. Olsson (1971) reported this species from the Gulf of Panama, and Keen (1971: 428) reported it from "Baja California south to the Galápagos Islands". The paratype of C. *togatum* from Costa Rica, the specimen figured by Olsson from Panama, and a specimen from Islas Galápagos examine by me have all of the essential characters of the holotype. The only two important variables in the material examined are the number of varices and the strength of ornamentation.

Cirsotrema togatum seems to be morphologically more similar to some of the Indo- Pacific *Cirsotrema*, such as *C. plexis* Dall, 1925, than to its western Atlantic congeners. It is the only one of the three species treated here that has been found in Islas Galápagos.

Cirsotrema hertzae n. sp.
Figs 6-10, 18

Epitonium (Cirsotrema) togatum Hertlein & Strong, 1951- DuShane, 1974: 35, fig.54.
Cirsotrema togatum Hertlein & Strong, 1951- Weil, Brown & Neville, 1999: 146, fig. 446.

Type material. Holotype (Figs 6-7,10, 18) 26.5 mm in length, 8.8 mm in width, SBMNH 149427. Paratypes: **MEXICO**; S. of Tetas de Cabra, Sonora State, 27°56'12"N, 111°04'15"W, 50-100 m, 2 lv, 3 dd, SBMNH 87384. Isla Candelero, Sonora, 27°55'33"N, 110°59'36"W, 18 m, 1 lv, SBMNH 87385. Isla Candelero, Sonora, 27°55'33"N, 110°59'29"W, 18m, 2 lv, SBMNH 87378. Punta Colorado, Sonora State, 27°54'30"N, 110°58'20"W, depth unknown, 2 dd, SBMNH 149429. SE of Punta San Antonio, Guaymas, Sonora, 27°54'N, 111°04'32"W, 55-82 m, 2 lv, 2 dd, SBMNH 423139.
Isla Danzante, Baja California Sur, 25°47'41"N, 111°16'55"W, 30-45 m, 4 lv, 5 dd, SBMNH 149427.

Isla Danzante, Baja California Sur, 25°47’15”N, 11°15’30”W, 30.5 m, 1 lv, 1 dd, SMBNH 149426. Isla María Cleofas, Islas Tres Marías, Nayarit State, 21°19’0”N, 106°13’30”W, 18-36 m, 1 dd, SBMNH 21938. Punta Juluapán, Colima State, 19°04’49”N, 104°23’40”W, 31 m, 3 lv, SBMNH 87377; 1 lv USNM 1146210. **PANAMA**: Coibita I., Veraguas Province, 8° 19' 0 N, 81° 10'60 W, 50 m, 1 lv (CH).

Type locality. Isla Danzante, Baja California Sur, W. Mexico, 25°47’41”N, 111°16’55”W, 30-45 m.

Other material examined. MEXICO: Isla Candelero, Sonora, 27°55’33”N, 110°59’29”W, 18m, 1 dd, SBMNH 83658. Isla María Cleofas, Islas Tres Marías, Nayarit State, 21° 16' N, 106° 13' 60” W, 18-21 m, 1 dd.(KK). **COSTA RICA**: Playas del Coco, Guanacaste, 10°34’36”N, 85°42’32”W, 24-37 m, 1 dd, SBMNH 149431 **PANAMA:** Off Punta Gorda, Golfo de Chiriquí, 8°18’0”N, 82°17’60”W, 25 -37 m, 1 lv (LM). Islas Secas, Golfo de Chiriquí, 07°57’24”N, 82°0”43”W, 18-37 m, 1 lv (LM). Islas Secas, Golfo de Chiriquí, 07°57’24”N, 82°0”43”W, 18-37 m, 2 lv (EFG 18571).

Other material. MEXICO: Isla San Pedro Nolasco, Sonora, 27°58.6’N, 111°22.7’W, 170-496 m, 1 spec., LACM 40-36. North of Punta La Gringa, Bahía de los Angeles, Baja California, 29°02.5’N, 113°32.5’W, 31 m, 1 spec., LACM 76-7. Manzanillo; 19°04’N, 104°22’W, 55 m;1 spec., CAS 06518. (Skoglund & Hertz, 2010)

Description. Holotype (Figs 6-7,10, 18) 26.5 mm in length, narrowly turreted (width/ length ratio 0.33). Protoconch missing. Teleoconch of 10 whorls; first 4 whorls shouldered; remaining whorls slightly convex, not shouldered. Axial sculpture of first 4 whorls of thin, ruffled lamellae; lamellae narrower than interspaces, crossing over sutures, joining adjacent whorls, forming crown at shoulder, each lamella progressively multiplying laterally, filling in former interspaces, developing a series of four axially oriented pits where each primary axial element meets the next; smaller, wrinkled, semilunar pits of various strengths forming where cusps of ruffled lamellae meet; elongation of axial elements developing into “buttresses”, crossing suture after fifth whorl; “buttresses” creating a series of large pits; 14 such pits on each of last two whorls. Spiral thread predominant on adapical half of first whorl, crossing axial elements, showing only in interspaces and on side of axial lamellae on later whorls, this obscured by appearance of additional axial lamellae, showing only through openings of ornamentation; secondary microscopic pattern of slightly slanted spiral threads developing on summit of congregated axial lamellae, creating a fenestrate pattern as they cross lamellae; five wide, low spiral bands developing on surface of secondary ornamental pattern; surface of bands covered with same fenestrate pattern as rest of whorl; bands as wide as interspaces, more prominent on varices. Basal cord (Fig. 10) strong, wide, sculptured with same microscopic fenestrate pattern as surface of whorls, outlined adapically by continued deep sutural pits of last whorl, and abapically by second spiral row of more elongated pits created by narrowing of axial elements. Peristome complete, sub-circular; outer and basal lip with thick varix, slightly patulous abapically; surface of varix covered with same ornamentation as whorls. Shell chalky-white; aperture shiny-white. Operculum black, with central nucleus.

Remarks. The only perceived variables from the holotype in the material examined are the number of varices, which may increase to 7 on a ten-whorl specimen, and the intensity of the ornamentation (Fig. 8). Some specimens begin to create the “buttress” elements on the 6th whorl. All specimens studied are readily separable from theirs congeners in the Panamic Province. The largest specimen reported (CAS 06518) measures *ca.* 39 mm (Skoglund & Hertz, 2010: 24).

Cirsotrema hertzae can be separated from *C. togatum* by the shell profile, which is smoothly elongate, rather than tabulated; by the “buttress” elements that cross over suture; by the fusion of axial lamellae that cover the entire surface of the whorls, instead of having the distinctly separated axial elements of *C. togatum* (compare Figs 17 and 18); by having 14 primary axial elements on last whorls, as defined by pits and “buttresses”, instead of 20 for *C. togatum*; by having less convex whorls; and by a wider, less ornamented basal cord (compare Figs 5 and 10).

Cirsotrema hertzae differs from *C. skoglundae* n. sp., by its slender, non-tabulated profile; by the “buttress” elements that cross the suture; by the pattern of larger axially oriented pits, which in *C. hertzae* consist of 14 rows of four, one for each primary axial element, while *C. skoglundae* shows a honeycomb pattern of larger pits that cover the surface of the whorls (compare Figs 18 and 19); and by having 14 primary axial elements on last whorls, *vs*. 25 for *C.skoglundae*. *Cirsotrema hertzae* seems to be morphologically more similar to its Indo-Pacific congeners, such as some forms of *C. varicosum* (Lamarck, 1822) that develop buttress-like elements across the suture, rather than to its Atlantic congeners.

Etymology. Named for Carole M. Hertz who, together with Carol Skoglund questioned the single-species approach to *C. togatum*. Mrs. Hertz has published numerous malacological articles and has been the editor of The Festivus, the well- known publication of the San Diego Shell Club, since 1976.

Cirsotrema skoglundae n. sp.

Figs 11-14, 19

Type material. Holotype (Figs 11-12, 14, 19) 12.2 mm in length, 6.4 mm in width, SBMNH 149430.

Paratypes: **MEXICO**: Punta La Gringa, Bahía de los Angeles, Baja California Norte, 29°01’56”N, 113°31’11”W, 20-40 m, 1 lv, 1 dd, SBMNH 149430. Bahía de los Angeles, Baja California Norte, 28°56’N, 113°31’W, 44 m, 1 lv, SBMNH 87379. Bahía de los Angeles, Baja California Norte, 28°56’N, 113°31’W, 30-45 m, 1 dd, SMBMN 87376. Isla Danzante, Baja California Sur, 25°45’27”N, 111°14’36”W, 45-75 m, 1 dd, SBMNH 149424. **COSTA RICA**: Playas del Coco, Guanacaste Province, 10°34’36”N, 85°42’32”W, 24-37 m, 1 lv, 1 dd, SBMNH 149428; 1 dd USNM 1146211. Islas Viradores, Guanasacte Province; 10°34’N, 85°34’W, 10-25 m, 1 dd, SBMNH 97582. Isla Negritos Adentro, Punta Arenas, 9°49’14’N, 84°51’25”W, 12-27 m, 1 dd, SBMNH 87380.

Type locality. Punta La Gringa, Bahía de los Angeles, Baja California Norte, 29°01’56”N, 113°31’11”W, 20-40 m.

Other material examined. PANAMA: Islas Secas, Golfo de Chiriquí; 07°57’24”N, 82°0”43”W, 18-37 m, 1 lv. (LM). Islas Secas, Golfo de Chiriquí, 07°57’24”N, 82°0”43”W; 18-37 m, 1 lv (EFG 29646).

Description. Holotype (Figs 11-12, 14, 19) 12.2 mm in length, widely tabulated (with/length ratio 0.52). Protoconch missing. Teleoconch of 6.5 whorls; whorls strongly shouldered, straight-sided, abapically incurved; shoulders excavated. Suture deep. Axial sculpture of approximately 25 thin, ruffled axial lamellae on early whorls; lamellae wider than interspaces; each lamella incrementally adding lamellae laterally on later whorls, eventually filling-in interspaces, creating beehive pattern of pits as crests of ruffles meet next axial element; axial elements on excavated shoulder first narrowing, then enlarging as they approach suture, creating large pits; similar process occurring pre-suturally, at base of whorls; 25 such pits at either end of whorls; seven axial elements becoming varicoid on last three whorls. Spiral sculpture of numerous spiral threads on interspaces and up abapertural side of lamellae, visible on later whorls only through pits; secondary spiral pattern, slightly diagonal to axis of shell, developing on top of fused axial lamellae, creating a fenestrate pattern when crossing axial elements. Basal cord thin (Fig. 14), rather sharp, sculptured with same fenestrate pattern as surface of whorls, delineated adapically by a series of large pits, a continuation of presutural pits of last whorl, and abapically by elongated pits, again produced by sharp narrowing of axial elements. Peristome complete, subcircular; labral varix rather narrow, patulous at anterior and posterior ends; inner lip thin, erect adapically. Shell white. Operculum missing.

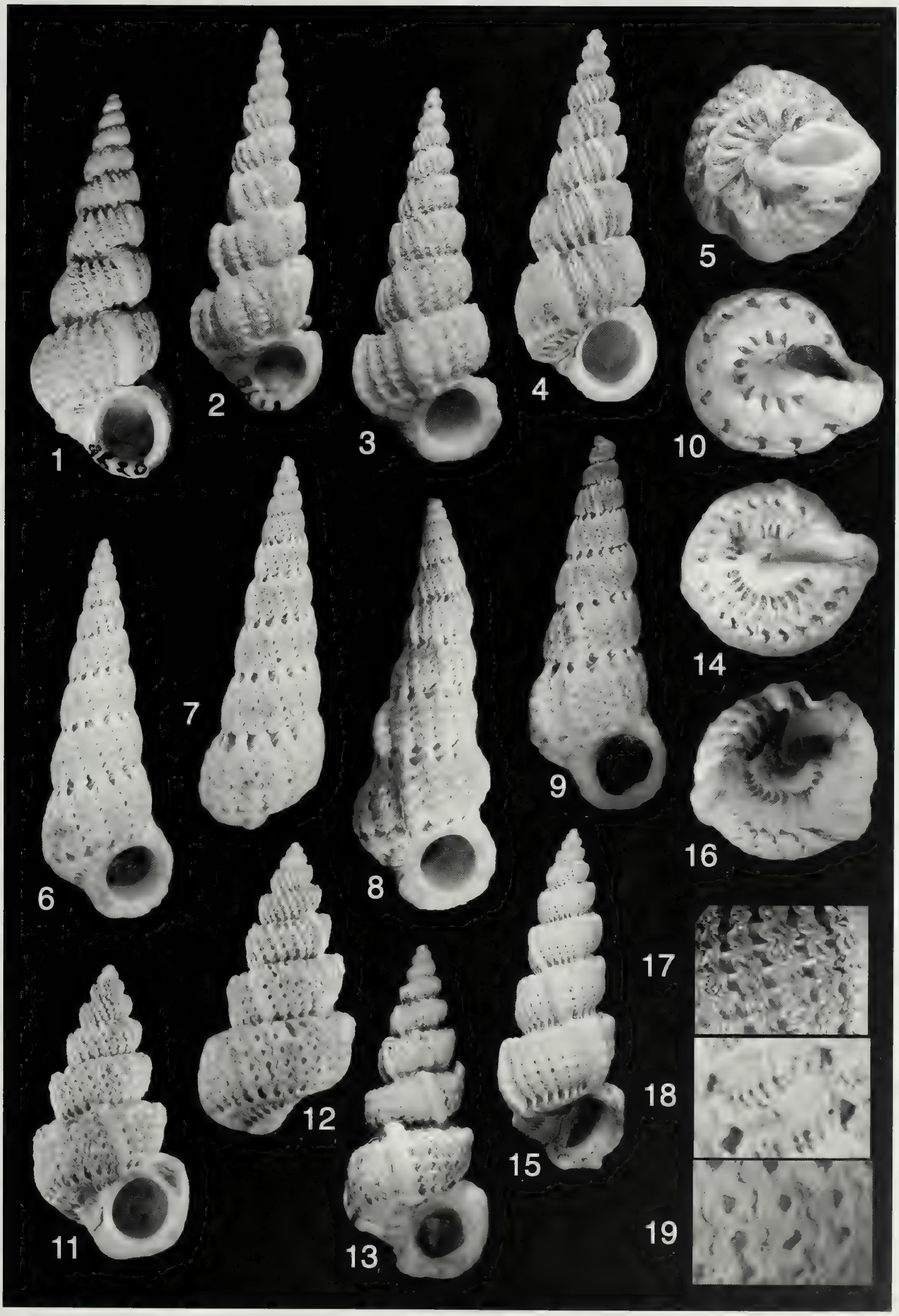
Remarks. All specimens examined, distributed from the Gulf of California to Costa Rica and Panama, conform with the holotype on all main characters; variables are the number of varices and strength of ornamentation. Specimens collected alive show a black operculum with a central nucleus.

Cirsotrema skoglundae differs from *C. togatum* by its more widely tabulated profile, its lack of clearly separated axial elements (compare Figs 17 and 19), its beehive pattern of pits (Fig. 19), and its smaller size. The largest known *C. skoglundae*, an eight-whorl specimen from Panama (Fig. 13) (LR), measures 16.2 mm *vs*. 37.7 mm for *C. togatum*.

Cirsotrema skoglundae can be separated from *C. hertzae* by its strongly tabulated profile, beehive pattern of pits (compare Figs 18 and 19), the thin, sharp basal cord, and small size. *C. hertzae* has a slender, non-tabulated profile with “buttress” elements crossing the suture, has deep pits only along its 14 primary axial elements, has fewer principal axial elements (14 *vs*. 25), has a wider, smoother basal cord (compare Figs 10 and 14), and grows to 39 mm.

Figures 1-16

1-5, 17. *Cirsotrema togatum* Hertlein & Strong, 1951. **1, 17.** Holotype length 37.5 mm, width 13.8 mm, CAS 065015 (photo G. Metz). **2.** Paratype, 14 mi. SE of Punta Judas. Costa Rica, 9°19’32”N, 84°29’30”W, 76.5-112 m. CAS 065516 (photo G. Metz). **3.** Isla Santa Fe, Islas Galápagos, Ecuador, 0° 49’S, 90° o4’W, 50 m, 32.6 mm, SBMNH 423136. **4-5.** SE of Punta San Antonio, Sonora State, 27°54’N, 111°04’32”W, 60-90 m, 23.3 mm, SBMNH 149423 (photos, D. Geiger). **6-10, 18.** *Cirsotrema hertzae* n. sp. **6-7, 10, 18.** Holotype 26.5 mm in length, 8.8 mm in width, Isla Danzante, Baja California Sur, W. Mexico, 25°47’41”N, 111°16’55”W, 30-45 m., SBMNH 149427. **8.** Coibita I., Veraguas Province, Panama, 8° 19' 0 N, 81° 10'60 W, in 50 m, 31.2 mm (CH). **9.** Islas Secas, Golfo de Chiriquí, 07°57’24”N, 82°0”43”, Panama, 12-25 m, 24 mm (EFG 18571). **11-14, 19.** *Cirsotrema skoglundae* n. sp. **11-12, 14, 19.** Holotype 12.2 mm in length, 6.4 mm in width, Punta La Gringa, Bahía de los Angeles, Baja California Norte, 29°01’56”N, 113°31’11”W, 20-40 m, SBMNH 149430 (photos Patricia Sadeghian). **13.** Islas Secas, Golfo de Chiriquí, 07°57’24”N, 82°0”43”W, 18-37 m, 16.2 mm (LM). **15-16.** *Cirsotrema dalli* Rehder, 1945, Bahía de Porto Bello, Panama, 37 m, 19.2 mm (EFG 8578).


1
2
3
4
5
10
7
9
14
6
8
16
17
18
19
11
12
13
15

Cirsotrema skoglundae is very similar to *C. dalli* Rehder, 1945 (Figs 15-16), its Atlantic cognate; however, *C. dalli* has taller whorls, more pronounced presutural pits due to a sharper, longer constrictions of axial elements, more varices, "of which there are two to three in each whorl"(Rehder, 1945: 128), a "prominent", much wider, less ornamented basal cord (Fig. 16), and grows to a much larger size. The type of *Cirsotrema dalli* (USNM 515240) measures 41 mm (Rehder, 1945: 128)

Etymology. Named for Carol Skoglund who, together with Carole Hertz questioned the single species approach to *Cirsotrema togatum*. Mrs. Skoglund has published numerous malacological articles and has kept up-to-date, almost single-handedly, A. Myra Keen's monumental work on Panamic mollusks (see Skoglund, 2002).

ACKNOWLEDGEMENTS

I am very grateful to Carol Skoglund of Phoenix, Arizona, and Carole Hertz of San Diego, California, for allowing me to use in this work material from their research. I am also indebted to Adrianne Calbreath and Paul Valentich-Scott (SBMNH) for the loan of the museum's Panamic *Cirsotrema* holdings, without which this work could not have been done. Carole Hertz, Lauretta Marr of Johnson City, Tennessee, and Kirstie Kaiser of Puerto Vallarta Mexico, allowed me to examine specimens in their collections. Some of the photographs used in this paper were taken by George Metz, Associate, Invertebrate Zoology Department, CAS, and Daniel Geiger and Patricia Sadeghian, SBMNH. My deepest thanks to them.

REFERENCES

DuShane, H. 1974. The Panamic-Galapagan Epitoniidae. *The Veliger* 16 (Suplement), 84 pp.

Keen, A. M. 1971. *Sea shells of tropical west America: Marine mollusks from Baja California to Peru*. Stanford University Press, i-xiv+1064 pp.

Olsson, A. A. 1971. Biological results of the University of Miami deep-sea expeditions. 77. Mollusks from the Gulf of Panama collected by R/V *John Elliott Pillsbury*, 1967. *Bulletin of Marine Science* 21(1): 35-92.

Rehder, H. 1945. Two new species of Cirsotrema (Epitoniidae) from Florida. *Proceedings of the Biological Society of Washington* 58: 127-129.

Skoglund, C. 2002. Panamic Province molluscan literature. Additions and changes from 1971 through 2001. *The Festivus* 33 (Supplement), 286 pp.

Skoglund, C. & Hertz, C.. 2010. *Cirsotrema togatum* Hertlein & Strong, 1951 (Gastropoda: Epitoniidae), a variable species or three distinct species? A preliminary study. *The Festivus* 42(2): 15-25.

Weil, A., Brown, L., & Neville, B. 1999. *The wentletrap book. Guide to the Recent Epitoniidae of the world.* Evolver, Rome, 244 pp.

A new species of *Plicopurpura* (Mollusca: Rapaninae) from the Lower Miocene Cantaure Formation of Venezuela

Bernard LANDAU
Centro de Geologia da Universidade de Lisboa, Campo Grande,
1749-016 Lisboa, Portugal
and International Health Centres, Av. Infante de Henrique 7, Areias São João,
P-8200 Albufeira, Portugal
bernielandau@sapo.pt

Geerat VERMEIJ
Department of Geology, University of California at Davis, One Shields Avenue,
Davis, CA 95616, USA
vermeij@geology.ucdavis.edu

KEYWORDS. Rapaninae, Mollusca, *Plicopurpura*, Miocene, Cantaure Formation, Venezuela, new species.

ABSTRACT. A new species of *Plicopurpura* (Mollusca, Gastropoda, Muricidae, Rapaninae) is described from the Lower Miocene Cantaure Formation of the Paraguaná Peninsula, Venezuela. This is the earliest record of the genus, which is represented in the Recent fauna by closely related species on either side of the Isthmus of Panama. This ancestral form still retains some characters common to most Rapaninae and has not yet developed the strongly inflated, auriculiform last whorl typical of the genus today. *Purpura weisbordi* Gibson-Smith & Gibson-Smith, 1979 is considered a junior subjective synonym of *Plicopurpura patula* (Linnaeus, 1758).

INTRODUCTION

Jung (1965) provided a systematic description of the fossil molluscan assemblage of the Cantaure shellbeds, on the Paraguaná Peninsula, Venezuela, including 95 gastropod species. A slow but steady trickle of later papers has dealt with undescribed taxa not covered in the initial monograph (Gibson-Smith 1974, 1979; Gibson-Smith & Gibson-Smith 1982, 1983, 1985; Vokes 1992, 1995; Landau 1996; Landau & Petit 1996; Gibson-Smith et al. 1997; Vermeij & Vokes 1997; Vermeij 2001, 2006; Landau et al. 2007; Vermeij et al. 2009; Beu 2010). Although these works have added another 51 gastropod species to the assemblage (see Appendix 1), there are probably about another 100 species still undescribed or unrecorded in the Cantaure fauna. In this and subsequent papers we hope to make the full extent of the gastropod assemblage of Cantaure known.

The Cantaure Formation (Hunter 1978; Gibson-Smith & Gibson-Smith 1979), with a thickness of about 75m (Jung 1965), is exposed in a series of arroyos about 500 m south of an abandoned house known as "Casa Cantaure", which is 14km west of Pueblo Nuevo in the Paraguaná Peninsula of Venezuela. The base of the unit is a *Balanus* bed containing blocks of granite, passing upwards through sands and calcareous sands (Hunter & Bartok 1974). Díaz de Gamero (1974), based on planktic forams, assigned a Lower Miocene age to the Cantaure Formation, placing it in the *Globigerinatella insueta* and *Praeorbulina glomerosa* Zones of Bolli (1966) and Zones N7-N8 of Blow (1969). Rey (1996) confirmed this age based on the nannofossil assemblage, and placing it in the *Helicosphaera ampliaperta* and *Sphenolithus heteromorphus* Zones, NN4-NN5.

The fullest understanding of the assemblage of fossil molluscs found in Cantaure is important from a taxonomic point of view; there is a high level of endemism (Jung 1965; Landau et al. 2008) and there is an important component of hard-bottom-dwelling gastropods (Vermeij 2001; Landau et al. 2009), which is very unusual in the Caribbean Neogene assemblages. It is also important from a paleobiogeographical standpoint, being chronologically the oldest Neogene deposit situated in the southernmost part of the Gatunian palaeobiogeographic province (Vermeij & Petuch 1986; Vermeij 2005; Landau et al. 2008).

Material and Methods

The material described here is from the Gibson-Smith collection housed in the Naturhistorisches Museum Basel (NHMB coll.), Switzerland and the Bernard Landau collection (BL coll.), now deposited in the Naturhistorisches Museum Wien (NHMW coll.), Vienna.

Most of the Caribbean Neogene literature distinguishes a Lower (Early), Middle and Upper (Late) Pliocene. In this series of papers on the Cantaure assemblage we have adopted the recent recommendation of the International Commission on Stratigraphy – accepted by the IUGS on June 30, 2009 – on the redefinition of the Pleistocene (now including the Gelasian Stage/Age as its lowermost unit), and the concomitant formal redefinition of the base of the Quaternary System/Period (and thus the Neogene/Quaternary boundary) by the Monte San Nicola GSSP and thus to be coincident with the bases of the Pleistocene and Gelasian.

SYSTEMATIC PALAEONTOLOGY

The description adopts the terminology suggested by Merle (1999, 2001), in which the following abbreviations are used:

P: Primary cord
s: secondary cord
SP: Subsutural cord
P1: Shoulder cord
P2-P6: Primary cords of the convex part of the teleoconch whorl
s1-s6: secondary cords of the convex part of the teleoconch whorl
example: s1 = secondary cord between P1 and P2; s2 = secondary cord between P2 and P3, etc.

APERTURE

ID: Infrasutural denticle
D1 to D6: Abapical denticles

SUPERFAMILY MURICOIDEA Rafinesque, 1815
FAMILY MURICIDAE Rafinesque, 1815
Subfamily **RAPANINAE** Gray, 1853
Genus ***Plicopurpura*** Cossmann, 1903

Plicopurpura primitiva n. sp.

Figs 1-6

Type material and dimensions. Holotype NHMB coll. NMB H18370, height 22.3 mm (Figs 1-3); paratype NHMW 2009z0075/0002, height, 21.4 mm (Figs 4-6).

Type locality. Cantaure Formation (early Miocene: Burdigalian), lower shell bed, 1 km southwest of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela (=locality GS12PGNA of Gibson-Smith & Gibson-Smith, 1979).

Diagnosis. A *Plicopurpura* species, with a small, solid shell, the last whorl has a relatively low expansion rate, thickened outer lip, denticulate within and sculpture of five broad elevated cords bearing rounded nodules.

Description. Shell small for genus, ovate, solid, with short spire, rapidly expanding whorls. Protoconch not preserved. Teleoconch of about 3.5 whorls. Suture superficial, initially straight, later undulating. Sculpture on first whorl eroded. Second whorl abraded, two nodulous spiral cords present, adapical cord at shoulder, delimiting broad, gently sloping sutural ramp; abapical cord at the suture; third nodulose spiral cord appearing on sutural ramp close to adapical suture on second half of penultimate whorl; secondary spiral thread developing between each pair of primary nodulous cords. Last whorl globose, P1-P5 broad, elevated, nodulose; SP narrower, weakly nodulous. Four secondary spiral cords of equal strength overly primary cords; s1 to s5 present with one tertiary spiral thread in interspaces on either side. Entire surface covered with close-set growth lamellae, giving somewhat scabrous appearance. Aperture wide, ovate, outer lip bevelled, crenulated in conformity with primary spiral cords; denticulate within, denticles just within lip margin, but not extending to it, extending into aperture as interrupted lirae; ID small, D1 strongest, D2-D5 of roughly equal strength; anal notch marked by very narrow adapical groove; siphonal canal narrow, open, slightly abaxially curved. Inner lip almost straight, weakly concave in parietal area; columellar and parietal area on venter forming a wide concavity; columellar callus thin, closely adpressed. Siphonal fasciole relatively prominent, rounded; positions of previous canals marked as coarse scabrous lamellae.

Discussion. The description given above is based on both the holotype and the paratype. Vermeij & Carlson (2000, p. 25) noted that an undescribed species of *Plicopurpura* was present in the Cantaure assemblage, represented by a single specimen in the Gibson-Smith collection in Basel, somewhat eroded and missing its spire (holotype, Figs 1-3). A second specimen was found by us (BL, 2005) with an incomplete aperture, but with well preserved surface sculpture and spire eroded, but present. Attempts to find further specimens during subsequent visits have been unsuccessful.

In the Recent fauna, closely similar species occur on either side of the Isthmus of Panama, *Plicopurpura patula* (Linnaeus, 1758) in the Caribbean Province and *Plicopurpura columellaris* (Gould, 1853) and *P. pansa* (Lamarck, 1816) in the Eastern Pacific Province. The Pacific forms have lower expansion rates than the Caribbean ones, giving the shell a less auriculiform shape, the tubercles on the spiral cords are finer and there are denticles often present within the aperture. Keen (1971) recognised both species in the tropical eastern Pacific, *P. columellaris* and *P. pansa,* and suggested they could easily be separated by the size of their shells and the colour of their apertures. Wellington & Kuris (1983) considered these two taxa to be conspecific. Kool (1993) discussed the presence of two *Plicopurpura* species, one on either side of the Isthmus of Panama, which he considered distinct taxa as the two no longer interbreed in nature. Arias-Rodriguez et al. (2007)

again separated the two tropical eastern Pacific species on the basis of chromosome analysis. Domínguez-Ojeda et al. (2009), based on laboratory observations on the reproduction and development of the two species, noted there were changes in their morphology at different reproductive stages in their embryonic and larval development and in the process of regeneration of their copulative organ. They again suggested the two tropical eastern Pacific "species" might be subspecies or morphological variation due to environmental conditions. Based on shell characteristics present in the large Recent Tropical American Pacific collections available to us (GJV), both of the eastern Pacific morphotypes are present with intergrading forms, suggesting a single species. Regardless of their degree of divergence, the Recent *Plicopurpura* shells on either side of the Isthmus of Panama are extremely similar, sharing the same inflated auriculiform last whorl, large aperture and seven or eight indistinct spiral cords bearing pointed nodules.

Plicopurpura primitiva n. sp. is clearly different from *P. patula* and *P. columellaris* in having a much smaller shell, the expansion rate of the adult teleoconch whorl is far less, resulting in a globose last whorl, rather than an auriculiform one as in the two Recent species. As a consequence of the lesser expansion rate of the last whorl in the fossil species the aperture is relatively narrower. The Recent Pacific forms of the *columellaris*-morphotype also have a less expanded last whorl than the Caribbean *P. patula*, and juvenile *P. patula* and some of the adult southern Caribbean forms also have a less auriculiform last whorl (GJV personal observation), however, in most of these Recent forms the last whorl is more expanded than in *P. primitiva*. Some shells of the *columellaris*-morphotype are the exception, which have a similarly globose last whorl and narrower aperture as seen in the fossil species. The spiral sculpture consists of fewer primary spiral cords, five as opposed to seven to eight in the living taxa, and the cords are elevated, bearing prominent nodules, as opposed to the relatively subdued cords bearing sharp nodules in the Recent shells. In some of the shells of the Recent Pacific *columellaris*-morphotype the nodules are obsolete on the last whorl, but the number of cords is always greater than in the fossil species. The inner lip is far more thickened in *P. primitiva* than in the living Caribbean *P. patula*, which tend to have a relatively thin outer lip for rapanines, and most specimens of *P. patula* do not have such prominent denticles developed within the lip as seen in the fossil species. The Recent Pacific forms of the *columellaris*-morphotype also have a less expanded last whorl than the Caribbean *P. patula*, and juvenile *P. patula* and some of the adult southern Caribbean forms also have a less auriculiform last whorl (GJV personal observation), however, in most of these Recent forms the last whorl is more expanded than in *P. primitiva*. Some shells of the *columellaris*-morphotype are the exception, which have a similarly globose last whorl and narrower aperture as seen in the fossil species. The spiral sculpture consists of fewer primary spiral cords, five as opposed to seven to eight in the living taxa, and the cords are elevated bearing prominent nodules as opposed to the relatively subdued cords bearing sharp nodules in the Recent shells. In some of the shells of the Recent Pacific *columellaris*-morphotype the nodules are obsolete on the last whorl, but the number of cords is always greater than in the fossil species. The inner lip is far more thickened in *P. primitiva* than in the living Caribbean *P. patula*, which tend to have a relatively thin outer lip for rapanines, and most specimens of *P. patula* do not have such prominent denticles developed within the lip as seen in the fossil species. The Recent Pacific forms of *columellaris*-morphotype also have a relatively thicker lip with denticles within as in *P. primitiva*, and some have indistinct folds on the ventral part of the columellar surface, absent in the *pansa*-morphotype, *P. patula* and the new fossil form. Unfortunately we have insufficient specimens of *P. primitiva* to have an idea of the intraspecific variability. The fossil species from Cantaure seems to be a *Plicopurpura* in the making, retaining many of the features common to other Rapaninae; a globular shape, solid shell, prominent spiral cords bearing nodules and a thickened, bevelled, outer lip bearing denticles within.

There is a sparse record for *Plicopurpura* in the fossil literature. Weisbord (1962) recorded *P. patula* from the Lower Pleistocene upper Mare Formation of Venezuela (Bermúdez & Fuenmayor, 1962; Gibson-Smith & Gibson-Smith, 1979; Macsotay, 2005b). These same specimens were later described as a new taxon *Purpura weisbordi* by Gibson-Smith & Gibson-Smith (1979) on the basis of the shape of the inner lip when viewed across the edge of the outer lip. Interestingly, one of the Holocene specimens from Amuay Bay, Paraguaná Peninsula of Venezuela (BL coll.) has the same excavation to the central part of the columella seen in the shell illustrated by Weisbord (1962, pl. 26, figs 15-16) resulting in a concave portion with a very sharp edge, slightly more rounded than the angular excavation seen in Wesibord´s shell. Apart from this curious feature the shells described as *Purpura weisbordi* are indentical to *P. patula*. In our opinion this is more likely to be a pathological deformity or post mortem changes than a morphological feature. For example, shells occupied by the terrestrial hermit crab genus *Coenobita*, have part of the columella missing (Ball, 1972, Kinosita & Okijama, 1968; Vermeij, 1987). We therefore consider *Purpura weisbordi* by Gibson-Smith & Gibson-Smith, 1979 a junior subjective synonym of *P. patula*. Aguilar & Fischer (1986) listed *P. pansa* for the Upper Pleistocene Montezuma Formation of Pacific Costa Rica (Baumgartner et al., 1984). We (BL) have specimens of *P. patula* from the Upper Pleistocene and Holocene of Venezuela, but as far as we are aware this is the first pre-Pleistocene record for the genus.

There is no information on where the holotype was found in the Cantaure beds. However, the paratype was found in the "lower bed" of Gibson-Smith & Gibson-Smith (1979), a bed of coarser sand lying on a *Balanus* bed containing blocks of granite (Hunter & Bartok 1974). Most of the rapanine gastropods present in the Cantaure assemblage are found in this lower unit (see Vermeij 2001; personal observation BL). This is to be expected, as *Plicopurpura* is an intertidal genus associated with rocky shores and in the Cantaure assemblage several other taxa associated with hard bottoms are found more commonly or almost exclusively in the "lower bed" (*Nerita*, undescribed *Tegula*, *Stramonita*, *Thais*, *Neorapana*, *Microrhytis*, *Ocinebrina*, *Hesperisternia*, *Macron*, and a large undescribed limpet; see Vermeij et al. 2009; personal observation BL). This assemblage of hard-bottom-dwelling gastropods found in the "lower bed" in Cantaure is extremely important as it is unparalleled in the rest of the tropical American Neogene and gives a glimpse into the taxa that inhabited these environments in the southern Gatunian Province at the beginning of Neogene time.

Etymology. The name reflects this being the earliest known *Plicopurpura* species.

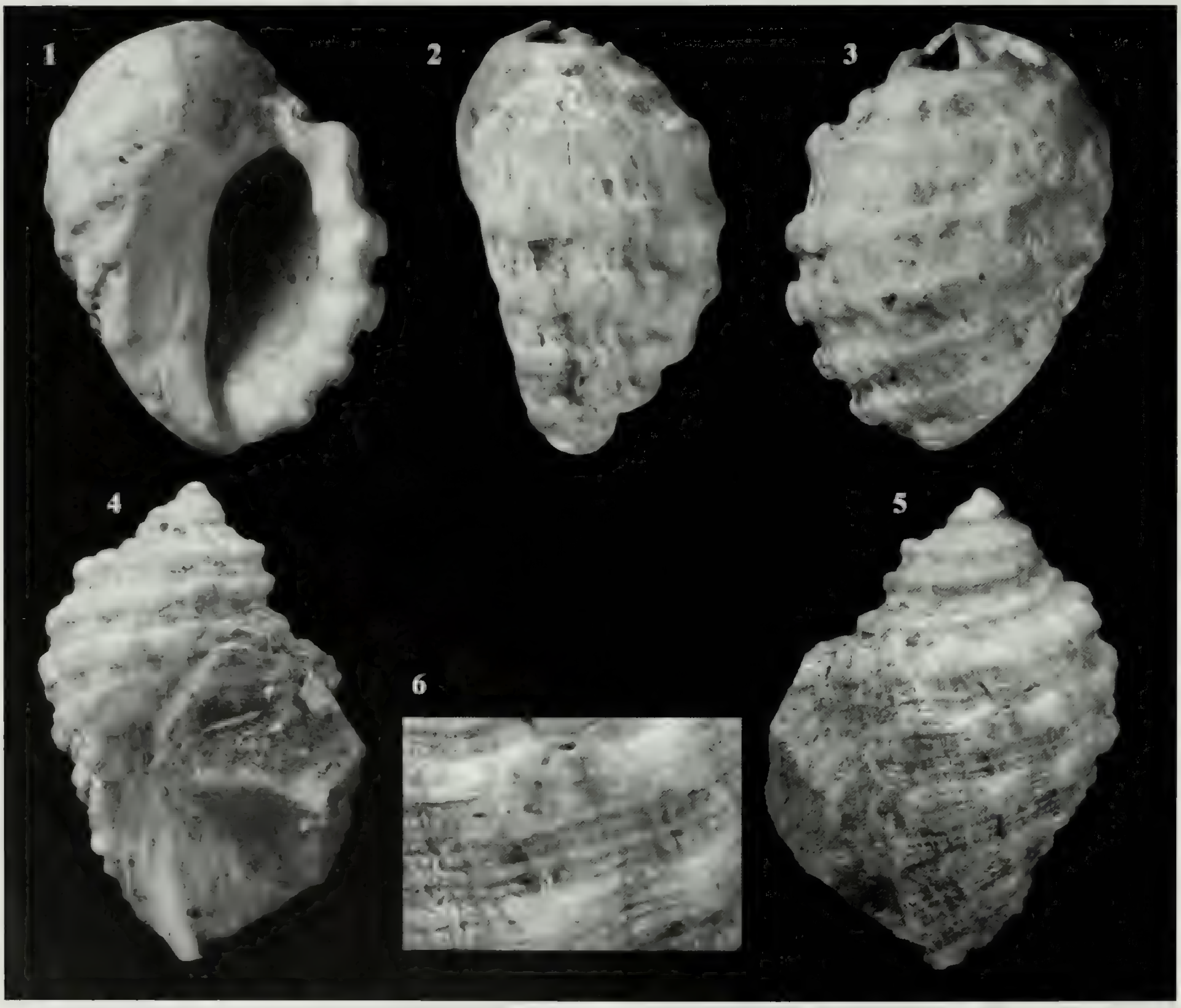


FIGURE CAPTIONS

Figs 1-6 - *Plicopurpura primitiva* n. sp., Cantaure Formation (early Miocene: Burdigalian), lower shell bed, Casa Cantaure, Paraguaná Peninsula, Falcón, Venezuela; 1-3, holotype NMB H18370, height 22.3 mm; 4-6 - paratype NHMW 2009z0075/0002, height 21.4 mm; 6, detail of surface sculpture of last whorl.

ACKNOWLEDGEMENTS

Dedicated to the memory of Phil Maxwell. We would like to thank Walter Etter and Olivier Schmidt of the Naturhistorisches Museum Basel (NMB), Switzerland, for access to the Gibson-Smith collection and the loan of type specimens from the Naturhistorisches Museum Basel collection. Dr. Alan G. Beu, GNS Science, Lower Hutt, New Zealand reviewed the MS and made many useful suggestions for improvement.

REFERENCES

Aguilar T., Fischer, R 1986. Moluscos de la Formación Montezuma (Plioceno-Plesitoceno; Costa Rica). *Geologica et Palaeontologica* 20: 209-241.

Arias-Rodriguez L., González-Hermoso J.P., Fletes-Regalado H., Rodríguez-Ibarra L.E., Del Valle Pignataro G. 2007. Cariotipos de los caracoles de tinte *Plicopurpura pansa* y *Plicopurpura columellaris* (Gastropoda: Muricidae). *Revista de Biología Tropical* 55: 853-866.

Ball E.E. 1972. Observations on the biology of the hermit crab, *Coenobita compressus* H. Milne Edwards (Decapoda; Anomura) on the west coast of the Americas. *Revista de Biologia Tropical* 20: 265-273.

Baumgartner P.O., Mora C.R., Butterlin J., Sigal J., Glacon G., Azéma J., Bourgois J. 1984. Sedimentación y Paleogeografía del Cretácico y Cenozoico del litoral pacífico de Costa Rica. *Revista Geologica de America Central* 1: 57-136.

Bermúdez P.J., Fuennayor A.N. 1962. Notas sobre los foraminíferos del Grupo Cabo Blanco, Venezuela. Boletín Informativo Asociacion Venezolana de Geologia, Minera y Petroleo, *Boletin Informativo* 5: 3-16.

Beu A.G. 2010. Neogene Tonnoidean gastropods of tropical and South America: Contributions to the Dominican Republic and Panama Paleontology Projects. *Bulletins of American Paleontology* 377-378, 1-550.

Blow, W.H. 1969. *Late middle Eocene to Recent planktonic foraminiferal biostratigraphy. In: Proceedings of the First International Conference on Planktonic Microfossils*, Geneva 1967 Vol. 1 Eds: Bronnimann, P.Renz, H.H. p. 199-422.

Bolli H.M. 1966. Zonation of Cretaceous to Pliocene marine sediments based on planktonic foraminifera. Asociacion Venezolana de Geologia, Minera y Petroleo, *Boletin Informativo* 9: 3-32.

Díaz de Gamero M.L. 1985. Estratigrafía de Falcón nororiental. VI Congreso Geológico de Venezuela (Caracas-Venezuela). *Memoria* 1: 454-502.

Domínguez-Ojeda D., González-Vega H., Nieto-Navarro J.T., Ruiz-Velazco A., Marcial de Jesús J. 2009. Aspectos biológicos de los caracoles *Plicopurpura pansa* y *Plicopurpura columellaris* mediante observaciones en condiciones de laboratorio. *Revista Electrónica de Veterinaria* 10: 1-7.

Gibson-Smith .J 1973. The genus *Voluta* (Mollusca: Gastropoda) in Venezuela, with description of two new species. *Geos* 20: 65-73.

Gibson-Smith J. 1974. On two new members of the family Ovulidae (Mollusca, Gastropoda) from the Cantaure Formation, Venezuela. Asociacion Venezolana de Geologia, Minera y Petroleo, *Boletin Informativo* 17 : 87-94.

Gibson-Smith J., Gibson-Smith W. 1974. The genus *Strombina* (Mollusca: Gastropoda) in Venezuela, with descriptions of a new recent and some fossil species. Asociacion Venezolana de Geologia, Minera y Petroleo, *Boletin Informativo* 17 : 49-85.

Gibson-Smith J., Gibson-Smith W. 1979. The genus *Arcinella* (Mollusca: Bivalvia) in Venezuela and some associated faunas. *Geos* 24: 11-32.

Gibson-Smith J., Gibson-Smith W. 1982a. The genus *Harpa* Lamarck (Mollusca: Gastropoda) in northern South America. *Tulane Studies in Geology and Paleontology* 17: 57-58.

Gibson-Smith J., Gibson-Smith W. 1982b. The subfamily Melampinae (Pulmonata: Basommatophora) in Venezuela, with the description of two new species. *The Nautilus* 96: 116-120.

Gibson-Smith J., Gibson-Smith W. 1983. Neogene melongenid gastropods from the Paraguaná Peninsula, Venezuela. *Ecologae Geologicae Helvetiae* 76 : 719-728.

Gibson-Smith J., Gibson-Smith W. 1985. A second melampid (Pulmonata: Basommatophora) from the early Miocene of Venezuela. *The Nautilus* 99: 87-89.

Gibson-Smith J., Gibson-Smith W. 1989. Further notes on *Eudolium (Galeodolium) subfasciatum. Tulane Studies in Geology and Paleontology* 21: 119.

Gibson-Smith J., Gibson-Smith W., Vermeij G.J. 1997. Pacific Mexican affinities of new species of the gastropod genera *Macron* (Pseudolividae) and *Neorapana* (Muricidae) from the Cantaure Formation (early Miocene) of Venezuela. *The Veliger* 40: 358–363.

Hunter V.F. 1978. Foraminiferal correlations of Tertiary mollusc horizons of the southern Caribbean area. *Geologie en Mijnbouw* 57: 193-203.

Hunter V.F., Bartok P 1974. The age and correlation of the Tertiary sediments of the Paraguaná Península, Venezuela. Asociacion Venezolana de Geologia, Minera y Petroleo, *Boletin Informativo* 17: 143-154.

Jung P. 1965. Miocene Mollusca from the Paraguana Peninsula, Venezuela. *Bulletins of American Paleontology* 49(223): 387-644.

Jung P. 1966. *Murex (Siratus) denegatus* Jung, new name. *Tulane Studies in Geology and Paleontology* 4: 77.

Jung P. 1989. Revision of the *Strombina*-group (Gastropoda: Columbellidae), fossil and living.

Schweizerische Paläontologische Abhandlungen 111: 1-298.

Keen A.M. 1971. *Sea shells of Tropical West America. Marine mollusks from Baja California to Peru.* Second edition. Stanford, California, Stanford University Press. 1064 p.

Kinosita H. & Okajima A. 1968. Analysis of shell-searching behavior of the land hermit-crab, *Coenobita rugosus* H. Milne Edwards. *Journal of Faculty of Science of University of Tokyo* 11: 293-358.

Kool S.P. 1993. Phylogenetic analysis of the Rapaninae (Neogastropoda: Muricidae). *Malacologia* 35: 155-259.

Landau B.M. 1996. A new species of *Morum* (Gastropoda: Cassidae) from the Lower Miocene Cantaure Formation of Venezuela. *Tulane Studies in Geology and Paleontology* 29: 53-56

Landau B.M., Petit R.E. 1996. New species of Cancellarioidea (Mollusca: Gastropoda) from the Lower Miocene Cantaure Formation of Venezuela. *Tulane Studies in Geology and Paleontology* 29: 145-150.

Landau B.M., Petit R.E., Silva C.M. da 2007. The Pliocene Cancellariidae (Mollusca: Gastropoda) of the Cubagua Formation (Cerro Negro Member) from Cubagua Island, with a new species from the Miocene Cantaure Formation, Venezuela. *The Veliger* 49: 27-43 ["2006"].

Landau B.M., Vermeij G..J, Silva C.M. da 2008. Southern Caribbean Neogene palaeobiogeography revisited. New data from the Pliocene of Cubagua, Venezuela. *Palaeogeography, Palaeoclimatology, Palaeoecology* 257: 445-461.

Landau B.M., Vermeij G.J., Silva C.M. da 2009. Pacific elements in the Caribbean Neogene gastropod fauna: the source-sink model, larval development, disappearance, and faunal units. *Bulletin de la Société Géologique de France* 180: 249-258.

Macsotay O. 2005. Olsitostromos, Olistolitos y Olistones en formaciones sedimentarias del Cretácico y Cenozoico de Venezuela: Origen Tectono-sedimentario. *I Simposio de Estratotipos de Venezuela,* Mérida, Venezuela, Julio 06-08-2005: 1-23.

Merle D. 1999. *La radiation des Muricidae (Gastropoda : Neogastropoda) au Paléogène: approche phylogénétique et évolutive*. Paris, unpublished thesis, Muséum national d'Histoire naturelle: vi + 499 p.

Merle D. 2001. The spiral cords and the internal denticles of the outer lip in the Muricidae: terminology and methodological comments. *Novapex* 2: 69-71.

Rey O.T. 1996. Estratigrafía de la Península de Paraguaná, Venezuela. *Revista de la Facultad Ingeniería de Venezuela* 11: 35-45.

Vermeij G.J. 1987. *Evolution and Escalation: An Ecological History of Life*. Princeton University Press, Princeton: 527p.

Vermeij G.J. 2001. Distribution, history, and taxonomy of the *Thais* clade (Gastropoda: Muricidae) in the Neogene of tropical America. *Journal of Paleontology* 75: 697-705.

Vermeij G.J. 2005. One-way traffic in the western Atlantic: causes and consequences of Miocene to early Pleistocene molluscan invasions in Florida and the Caribbean. *Paleobiology* 31: 624-642.

Vermeij G.J. 2006. The *Cantharus* group of pisaniine buccinid gastropods: review of the Oligocene to Recent genera and description of some new species of *Gemophos* and *Hesperisternia*. *Cainozoic Research* 4: 71-96.

Vermeij G.J., Carlson S.J. 2000. The muricid gastropod subfamily Rapaninae: phylogeny and ecological history. *Paleobiology* 26: 19-46.

Vermeij G.J., Frey M.A., Landau B.M. 2009. The gastropod genus *Nerita* in the Neogene of tropical America. *Cainozoic Research* 6: 61-70.

Vermeij GJ, Petuch EJ 1986. Differential extinction in tropical American molluscs: endemism, architecture, and the Panama land bridge. *Malacologia* 27: 29-41.

Vermeij G.J., Vokes E.H. 1997. Cenozoic Muricidae of the western Atlantic region. Part 12. The subfamily Ocenebrinae (in part). *Tulane Studies in Geology and Paleontology* 29: 69-118.

Vokes E.H. 1979. The age of the Baitoa Formation, using Mollusca for correlation. *Tulane Studies in Geology and Paleontology* 15: 105-116.

Vokes E.H. 1989. Neogene paleontology in the northern Dominican Republic. 8. The family Muricidae (Mollusca: Gastropoda). *Bulletins of American Paleontology* 97(332): 5-94.

Vokes E.H. 1992. Cenozoic Muricidae of the western Atlantic region. Part 9. *Pterynotus, Poirieria, Aspella, Dermomurex, Calotrophon, Acantholabia,* and *Attliliosa*; additions and corrections. *Tulane Studies in Geology and Paleontology* 25: 1-108.

Vokes E.H. 1994. Cenozoic Muricidae of the western Atlantic region. Part 10. The subfamily Muricopsinae. *Tulane Studies in Geology and Paleontology* 26: 49-160.

Vokes E.H. 1995. Two new Cenozoic Muricinae (Gastropoda: Muricidae) of the western Atlantic region. *Tulane Studies in Geology and Paleontology* 28: 119-122.

Vokes E.H. 1998. Neogene paleontology in the northern Dominican Republic. 18. The superfamily Volutacea (in part) (Mollusca: Gastropoda). *Bulletins of American Paleontology* 113(354): 5-54.

Wellington G.M., Kuris A.M. 1983. Growth and shell variation in the tropical eastern Pacific intertidal genus *Purpura*: ecological and evolutionary implications. *The Biological Bulletin* 164: 518-535

Appendix 1

Gastropod taxa described or recorded and figured for the Cantaure Formation of Venezuela since Jung (1965) given in chronological order of publication, with pagination and figure information when the figured specimens are from the Cantaure assemblage.

Taxon and author	Record other than original description	Page	Figure
Chicoreus (Siratus) denegatus (Jung, 1966) n.n. pro *Murex triangularis* Jung, 1965 non Brown, 1818	fig. in Jung, 1965	77	pl. 70, figs 1-2
Voluta cantaurana Gibson-Smith, 1973		68	pl. 3, figs 1-3
Mitrella cantaurana (Gibson-Smith & Gibson-Smith, 1974) (originally described as *Strombina*; see Jung, 1989)		58	pl. 2, fig. 8, pl. 3, fig. 8, pl. 4, figs 8-10
Simnia winifredae Gibson Smith, 1974		88	pl. 1, figs 1-2
Jenneria venezuelana Gibson-Smith, 1974		92	pl. 1, figs 8, 10, 11, 12
Vasum tuberculatum Gabb, 1873	E. Vokes, 1979, 1998	112	pl. 2, fig. 3
Harpa myrmia Olsson 1931	Gibson-Smith & Gibson-Smith, 1982a	57	figs 1-3
Tralia venezuelana Gibson-Smith & Gibson-Smith, 1982b		119	figs 7-9
Melongena venezuelana Gibson-Smith & Gibson-Smith, 1983		720	figs 1-5, 13
Torquifer barbascoana Gibson-Smith & Gibson-Smith, 1983		727	figs 8-9
Pedipes mirandus Gibson-Smith & Gibson-Smith, 1985		88	fig.1
Endolium subfasciatum Sacco, 1890	Gibson-Smith & Gibson-Smith, 1989	119	fig. 1
Chicoreus cornurectus (Guppy, 1876)	E. Vokes, 1989	31	no fig.
Chicoreus corrigendum E. Vokes, 1989		34	no fig.
Sincola (Dorsina) pigea (Olsson, 1964)?	Jung, 1989	251	no fig.
Poirieria (Panamurex) improcerus E.Vokes, 1992		46	pl. 9, figs 5-6
Poirieria (Panamurex) gibsonsmithi E.Vokes, 1992		48	pl. 10, figs 5-6
Muricopsis (Risomurex) crassicosta (Benoist, 1873)	E. Vokes, 1994	72	no fig.
Chicoreus winifredae E.Vokes, 1995		119	pl. 1, fig. 1
Morum (Oniscidia) jungi Landau, 1996		53	pl. 1, figs 1-2
Cancellaria hodsonae Landau & Petit, 1997	fig. in Jung, 1965	145	pl. 75, figs 7-8
Cancellaria (Bivetiella) jungi Landau & Petit, 1997	fig. in Jung, 1965	146	pl. 75, figs 1-2
Cancellaria (Charcolleria) emilyvokesae Landau & Petit, 1997		147	pl. 1, fig. 1
Cancellaria (Massyla) cantaurana Landau & Petit, 1997		147	pl. 1, fig. 2
Axellela yara Landau & Petit, 1997		148	pl. 1, fig. 3
Narona barystoma (Woodring, 1970)	Landau & Petit, 1997	148	pl. 1, fig. 4
Macron constrictus G-S & G-S & Vermeij, 1997		358	figs 1-3
Neorapana rotundata G-S & G-S & Vermeij, 1997		360	figs 4-9
Ocinebrina francesae Vermeij & E. Vokes, 1997		78	pl. 2, figs 1-5
Pterorytis (Microrhytis) christopheri Vermeij & E. Vokes, 1997		101	pl. 12, figs 1-3
Thais brevicula Vermeij, 2001		697	figs 1.1-1.4
Stramonita bifida Vermeij, 2001		700	figs 1.5-1.7
Stramonita semiplicata Vermeij, 2001		701	figs 1.26-1.28
Hesperisternia distans Vermeij, 2006			
Cancellaria (Bivetiella) lugogonzalezorum Landau, Petit & Silva, 2007		33	figs 17-19
Cancellaria (Bivetopsia) herberti Landau, Petit &		35	figs 23-25

Silva, 2007			
Nerita rugulosa Vermeij, Frey & Landau, 2009		63	figs 1-3
Nerita (Theliostyla) paucigranosa Vermeij, Frey & Landau, 2009		66	figs 4-6
Bursa rhodostoma (G. B. Sowerby II, 1835)	Beu, 2010	57	pl. 5, figs 10, 12
Bursa rugosa (G. B. Sowerby II, 1835)	Beu, 2010	59	pl. 6, fig. 7
Distorsio biangulata Beu, 2010		80	pl. 22, figs 4, 7; pl. 51, figs 4, 5
Distorsio jungi Beu, 2010		90	pl. 16, figs 1-11
Distorsio mcgintyi Emerson & Puffer, 1953	Beu, 2010	92	no fig.
Monoplex cercadicus (Maury, 1917)	Beu, 2010	148	no fig.
Monoplex jackwinorum Beu, 2010		155	pl. 37, figs 6-9
Monoplex ritteri Schmelz, 1989	Beu, 2010	172	pl. 43, figs 2-4
Turritriton domingensis (Gabb 1873)	Beu, 2010	193	no fig.
Cypraecassis cantaurana Beu, 2010		225	pl. 63, figs 3-7; pl. 64, figs 4, 9
Cypraecassis testiculus (Linnaeus, 1758)	Beu, 2010	228	no fig.
Echinophoria hadra (Woodring & Olsson 1957)	Beu, 2010	243	no fig.
Semicassis aldrichi (Dall 1890)	Beu, 2010	246	pl. 68, figs 6, 8

Description of four new species of *Cochlespira* (Gastropoda: Turridae) from the New World

Emilio Fabián GARCIA
115 Oak Crest Dr.
Lafayette, Louisiana 70503- USA
Efg2112@louisiana.edu

KEYWORDS. Gastropoda, Turridae, Cochlespirinae, *Cochlespira*, new species, Colombia, Barbados, Gulf of Mexico, Panama.

ABSTRACT. Four new species of *Cochlespira* from the New World are described and compared with their most similar congeners: *Cochlespira bevdeynzerae* n. sp. and *C. leeana* n. sp. from the Caribbean coast of Colombia and Barbados; *C. cavalier*, from the west coast of Florida, Gulf of Mexico, USA, and *C. laurettamarrae* n. sp. from southern Panama.

INTRODUCTION

The genus *Cochlespira* is a well-defined, elegant group of turrids characterized by their elongated, pagodiform shells with a long siphonal canal, and whorls with a conspicuous peripheral keel ornamented with spinose projections. Only eight Recent species have been assigned to this genus. Four species have been described from the western Pacific: *Cochlespira pulchella* (Schepman, 1913) (with three other subspecies), *C. travancorica* (Smith E. A., 1896), *C. kuroharae* (Kuroda, 1959), and *C. beuteli* (Powell. 1969); one from the eastern Pacific: *C. cedonulli* (Reeve, 1843); and three from the western Atlantic: *C. elegans* (Dall, 1881), *C. radiata* (Dall, 1889), and *C. elongata* Simone, 1999. As shown by the dates of publication, only four species were published in the 20th century. As *Cochlespira* species inhabit deep to very deep water, usually in very soft bottom, many species of this genus have been difficult to collect, mainly by means of research vessels and as by-catch of commercial trawlers and dredging vessels.

The Panamic Province species described herein was obtained from trawlers working in deep water off Punta Mala, at the entrance of Panama Bay, southern Panama, and nearby Chiriquí Bay; the two Colombian species were collected by commercial dredging and trawling operations off Cabo de la Vela, in eastern Colombia and Barbados, and the Gulf of Mexico species was dredged by Mr. Jim Moore who, operating his own boat, dredged along the offshore waters of the northeastern Gulf of Mexico in the early 1960's. This last, very remarkable species, was a surprising find, as the waters off the west coast of Florida are among the best sampled in the United States.

The description of these four species increases the number of taxa assigned to *Cochlespira* by 50%.

Abbreviations

ANSP: Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.
EFG: author's collection
HGL: Harry G. Lee collection, Jacksonville, Florida
UF: University of Florida, Florida Museum of Natural History, Gainesville, Florida.
dd: empty shell
lv: live mollusk

SYSTEMATICS

Superfamily **CONOIDEA** Fleming, 1822
Family **TURRIDAE** Swainson, 1840
Subfamily **COCHLESPIRINAE** Powell, 1942
Genus ***Cochlespira*** Conrad, 1865
Type species: *Pleurotoma cristata* Conrad, 1847 (by virtual monotypy)

Cochlespira bevdeynzerae n. sp.
Figs 1-3

Type material. Holotype 46.5 mm in length, ANSP 424277 1 dd. Paratypes: 1 dd, 50 mm in length, Colombia, off Taganga, 11°17.320'N, 74°12.427'W, in 200 m, , Enrique Yidi col., Barranquilla, Colombia.; 1 dd, 45.6 mm in length, Colombia, off Guajira Peninsula, trawled in approximately 500 m, EFG 29936.

Type locality. Colombia, off Cabo de la Vela (12° 12' N, 72°10'W), Guajira Peninsula(also spelled Goajira), in deep water.

Distribution. Known only from the type locality.

Description. Holotype 46.5 mm in length, elongate-pagodiform (width/ length ratio without spines: 0.338), surface glossy. Protoconch damaged;

remaining portion of last protoconch whorl smooth. Teleoconch of 7 sharply angular, strongly keeled whorls; keel positioned slightly anterior to center on first two whorls, gradually moving to mid- shoulder slope on later whorls; edge of keel ornamented with sharply erected spines (Fig. 3); 17 spines on each of last two whorls; shoulder slope ornamented with a thin, sharply raised carina; carina positioned next to keel on early whorls, advancing to mid shoulder on later whorls, creating a strongly concave surface adapically. Suture impressed. Axial ornamentation composed of arcuate lines between carina and suture, oblique ribs between mid-shoulder carina and keel (Fig. 3), and axially oriented lines below keel. Spiral sculpture absent, except for slightly oblique, evanescing threads on siphonal canal. Sinus U-shaped, deep, occupying area between mid-shoulder carina and suture. Total length of aperture 29.9 mm; anterior canal approximately 19.5 mm in length, slightly twisted to the left, constricted by weak columellar callus at anterior end, opening wider anteriorly. Columellar callus thin, posteriorly recurved to meet suture, whitish tan, posterior half smooth; weak, oblique lines caused by spiral ornamentation showing on anterior half. Shell whitish, profusely marked with axially oriented streaks of light and dark tan coloration; darker lines running from central shoulder carina to adapertural half of spines (Fig. 3). Operculum unknown.

Discussion. *Cochlespira bevdeynzerae* differs from *Cochlespira elegans* (Fig. 5), *C. elongata* (Fig. 4) and *C. radiata* (Figs 18-20), the three Atlantic species, by not having spiral ornamentation in its teleoconch whorls; moreover, the new species grows to 46.5 mm, while *C. elongata* grows to only 37 mm (Simone, 1999:106) and *C. radiata* to 32 mm (Rosenberg, 2009). *Cochlespira elegans* does grow up to 60 mm (Rosenberg, 2009), but its granulose surface, double row of projections at the periphery and lack of a mid-shoulder carina further differentiate it from the new species.

Cochlespira bevdeynzerae is most similar to the Panamic species *C. laurettamarrae* n. sp. (Figs 6-10), described herein; both species grow to a similarly large size and lack spiral ornamentation except on the siphonal canal. However, *C. laurettamarrae* is white and has a lusterless surface, fewer spines on last two whorls (compare Figs 3 and 8), and a shorter siphonal canal.

Etymology. Named for Mrs. Beverly Deynzer, of Sanibel Island, Florida. Mr. Al Deynzer, her husband and a well-known collector of Mitridae and Costellariidae, donated the holotype and asked that the species be named for her in celebration of their 50th wedding anniversary.

Cochlespira cavalier n. sp.
Figs 12-17

Type material. Holotype 29.5 mm in length, ANSP 424280 1 dd.

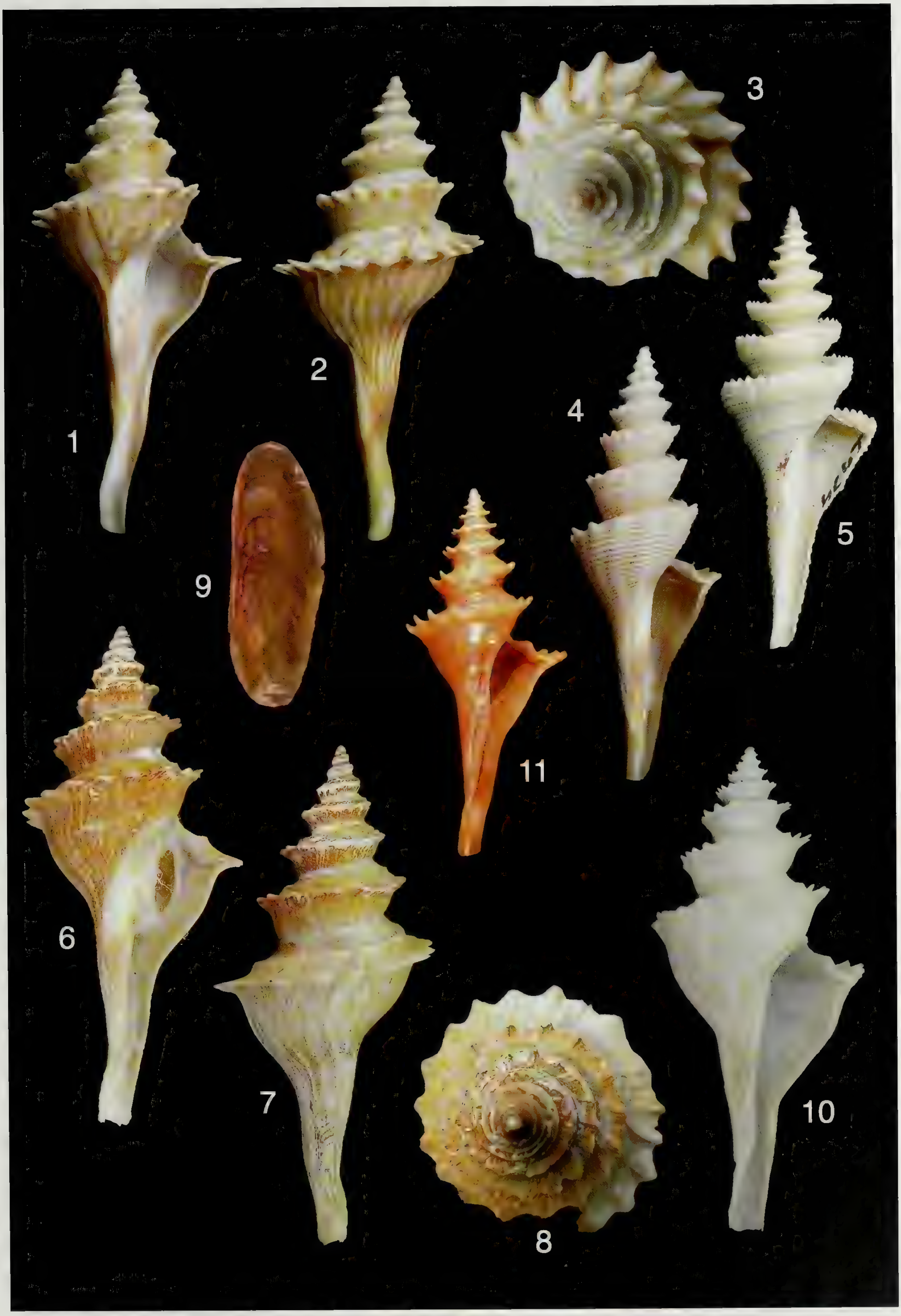
Type locality. Florida, west of Egmont Key (27° 36' 0.3"N, 82° 45' 39"W), Hillsborough Co, in 85 m.

Distribution. Known only from the type locality.

Description. Holotype 29.5 mm in length, only slightly glossy, narrowly pagodiform (width/ length ratio without spines: 0.254). Protoconch eroded, of approximately two whorls. Teleoconch of 7.5 sharply angular, strongly keeled whorls; keel appearing slightly anterior to center on early whorls, positioned at mid-shoulder on later whorls, ornamented with small, sharply pointed, adapically oriented, triangular spines; 25 spines on each of last two whorls. Axial ornamentation lacking. Spiral ornamentation of two cords on shoulder, immediately adjacent to peripheral keel (Fig. 17); well-incised cords starting to appear below keel on forth whorl; 7 cords, somewhat uneven in width, showing on penultimate whorl, and 8 on last whorl; last whorl showing a stronger, carinated cord at sutural level (Fig. 15); approximately 25 cords appearing anterior to carinated cord; cords on siphonal canal pustulose, creating a grate-like appearance (Fig. 16). Sinus U- shaped, fully occupying shoulder of whorl (Fig. 17). Total length of aperture 14.5 mm; length of siphonal canal 10.3 mm; columellar callus white, glossy, posteriorly recurved at level of suture; lirations from spiral ornamentation vaguely showing through surface. Shell egg-white in coloration. Operculum unknown.

Figures 1-11

1-3. *Cochlespira bevdeynzerae* n. sp. Holotype ANSP 424277 length 46.5 mm, width (without spines) 15.7 mm, off Cabo de la Vela (12° 12' N, 72°10'W), Goajira Peninsula, Colombia, in deep water. **4.** *Cochlespira elongata* Simone, 1999. Trawled off Santos, São Paulo State, Brazil, in 100-150 m, 32.8 mm in length (EFG 26705). **5.** *Cochlespira elegans* (Dall, 1881). off Egmont Key, west Florida, dredged in 420 m, length 40.5 mm (EFG 4647). **6-10.** *Cochlespira laurettamarrae* n. sp. **6-9.** Holotype ANSP 424278 length 57.2 mm, width (without spines) 21.5 mm, off Punta Mala (7° 28' 0" N, 80° 0' 0" W), west entrance to Bahía de Panamá, southern Panamá, in 245 to 300 m.**10.** Paratype EFG 29641 length 52.4 mm, width (without spines) 16.5 mm, Golfo de Chiriquí, southern Panama, in 300 m. **11.** *Cochlespira cedonulli* (Reeve, 1843), Costa Rica, 9°23.80'N. , 84°36.70'W, in 45 m, length 19.6 mm (EFG 26878).


3
2
1
4
5
9
11
6
7
10
8

Discussion. *Cochlespira cavalier* can readily be differentiated from *Cochlespira radiata* (Figs 18-20), a Gulf of Mexico and Caribbean species, by its more elongated profile, shorter, more numerous spines on keel (compare Figs 14 and 19), the absence of a central shoulder carina (compare Figs 17 and 19), a carinated spiral cord at the base of the last whorl (Fig. 15), and pustulose, grate-like ornamentation on siphonal canal (Fig. 16). This canal ornamentation is very similar to that of *Cochlespira elegans* (Fig. 5), another Gulf of Mexico and Caribbean species, but "in this species the anterior part of the whorls is covered with granulose spirals" (Dall, 1889: 78), not just the canal. Although *Cochlespira cavalier* shares with *C. elegans* the lack of a mid-shoulder carina, the latter grows much larger in size, and has a double crown of numerous, small projection on its keel. *Cochlespira elongata* (Fig. 4), from Brazil, has a mid-shoulder carina, is "pale cream to pale brown in coloration" (Simone,1999: 106), has a different surface sculpture, and lacks the secondary carinated spiral cord on the last whorl.

Etymology. Named for the ship Cavalier, the vessel used by Mr. Jim Moore, a well- known mariner who dredged offshore in the northwestern quadrant of the Gulf of Mexico in the early 1960's. The specific epithet is used here as a noun in apposition.

Cochlespira laurettamarrae n. sp.

Figs 6-10

Type material. Holotype 57.2 mm in length, ANSP 424278 1 lv - Paratype, 52.4 mm in length, EFG 29641, Golfo de Chiriquí, southern Panamá, in 300 m, 1 dd.

Type locality. Panamá, off Punta Mala (7° 28' 0" N, 80° 0' 0" W), west entrance to Bahía de Panamá, 245 to 300 m.

Distribution. Known only from the type material.

Description. Holotype 57.2 mm in length. lusterless, elongate pagodiform (width/ length ratio without spines: 0.376). Protoconch missing. Teleoconch of 7, sharply angular, strongly keeled whorls; keel appearing somewhat posterior to center of whorls; edge of keel ornamented with rather low, wide, triangular spines; 20 spines on each of last two whorl (Fig. 8); mid-shoulder slope ornamented with sharp, raised carina that divides shoulder into two equal, slightly concave areas; carina somewhat crenulated by axial ornamentation. Suture impressed. Axial ornamentation of arcuate lines between mid-shoulder carina and suture, and low, oblique cords between mid-shoulder carina and keel, becoming axially oriented below keel. Spiral ornamentation lacking except for siphonal canal, where strong, somewhat undulating cords appear; cords becoming somewhat granulose when intersecting axial ornamentation. Sinus U- shaped, deep, occupying area between mid-shoulder carina and suture. Total length of aperture 33.5 mm; anterior canal approximately 16.5 mm in length. Columellar callus posteriorly arched to meet sutural line, smooth, thin but conspicuously separated from rest of whorl by slightly incised line, milky-white. Shell color white, stained brownish-yellow by floor deposits. Operculum 7.4 mm in length, pale tan, leaf shaped, with terminal nucleus (Fig. 9).

Discussion. The paratype (Fig. 10) is slightly narrower than the holotype, measuring 52.4 mm in length and 16.5 mm in width (without spines). It has 22 spines on the penultimate whorl and 24 on the last. Its spines are more adapically directed than those of the holotype, which are almost vertical to axis. This specimen was previously reported by the author as a probable undescribed species (García, 2001).

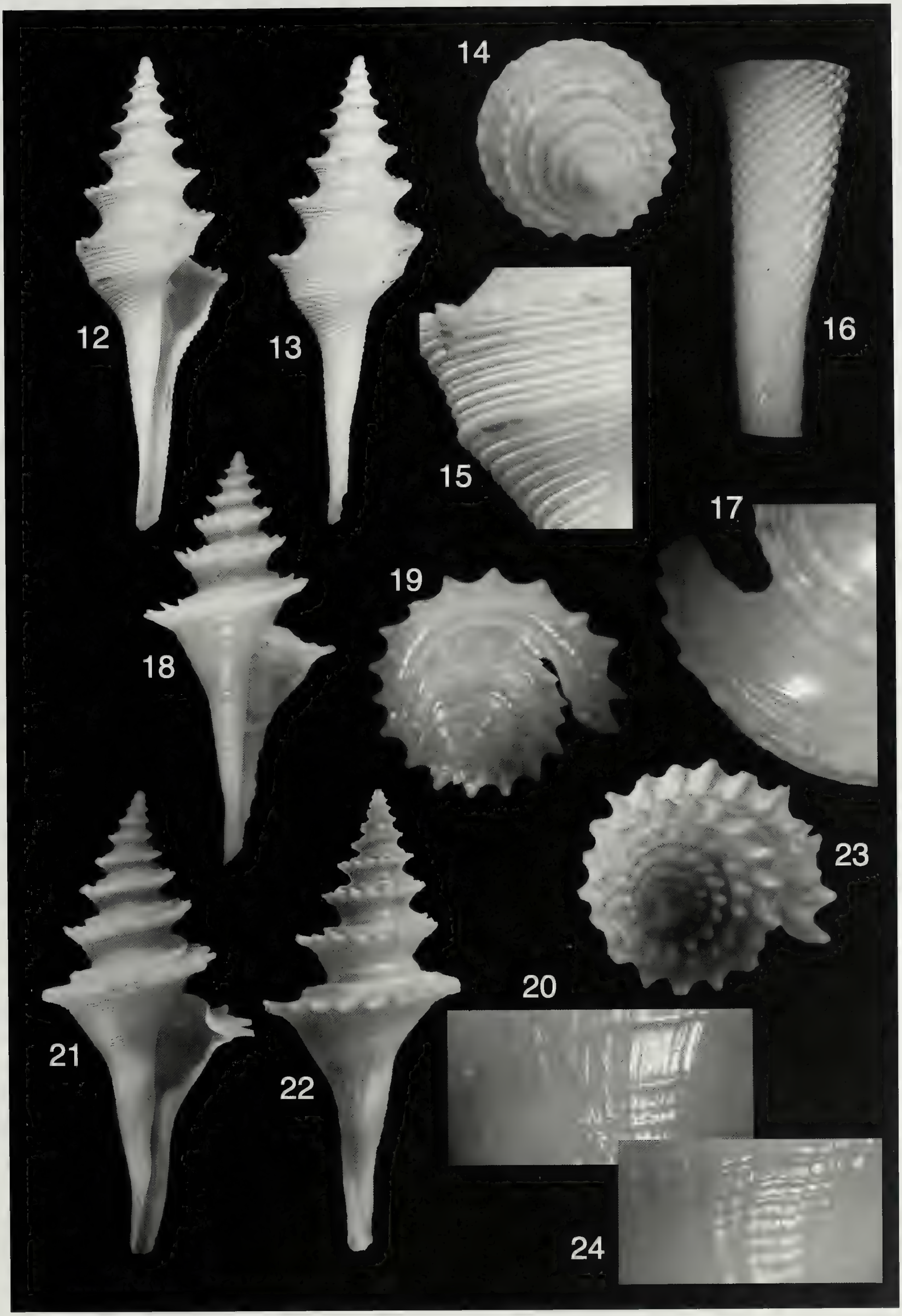
Cochlespira laurettamarrae differs from *C. cedonulli* (Fig. 11), its only congener from the eastern Pacific, by its larger size, its lusterless, white shell instead of the tan coloration and polished, almost smooth surface of C. cedonulli, and its less pointed, more numerous spines on the mid-whorl keel.

Cochlespira laurettamarrae is most similar to the Caribbean species *C. bevdeynzerae*, described herein. Both species grow to a similarly large size and lack spiral ornamentation except on the siphonal canal. However, *C. laurettamarrae* is white and has a lusterless surface, more numerous spines on the last two whorls (compare Figs 3 and 8), and a shorter siphonal canal,

Etymology. Named for Mrs. Lauretta Marr, of Johnson City, Tennessee, USA, an enthusiastic collector of Panama shell and donor of the type material.

Figures 12-24

12-17. *Cochlespira cavalier* n. sp. Holotype ANSP 424280 length 29.5 mm, width (without spines) 7.5 mm, west of Egmont Key (27° 36' 0.3"N, 82° 45' 39"W), Hillsborough Co, western Florida, in 85 m. **18-20.** *Cochlespira radiata* (Dall, 1889), off Egmont Key, western Florida, in 200 m, length 16.5 mm (EFG 4303). **21-24.** *Cochlespira leeana* n. sp. Holotype ANSP 424279 length 24 mm, width (without pines) 18.5 mm, off Cabo de la Vela (12° 12' N, 72°10'W), Guajira Peninsula, Colombia, in deep water.


14
16
12
13
15
17
19
18
23
20
21
22
24

Cochlespira leeana n. sp.
Figs 21-24

Type material. Holotype ANSP 424279 24 mm, 1 dd. Paratypes 1: 18.5 mm, UF 436393 paratype 2: 22.8 mm, HGL collection; 3: EFG 29642; all Barbados, west of Sandy Lane Bay, St. James, 184- 200 m., 3 dd.

Type locality. Colombia, off Cabo de la Vela (12° 12' N, 72°10'W), Guajira Peninsula (also spelled Goajira), in 80 to 100 m.

Distribution. Known only from Colombia and Barbados.

Description. Holotype 24 mm in length, semi-glossy, elongate pagodiform (width/ length ratio without spines 0.77). Protoconch damaged, remaining portion of last whorl smooth. Teleoconch of 9 sharply angular, strongly keeled whorls; keel appearing slightly anterior to center on early whorls, becoming more centered on later whorls, ornamented with sharply pointed, triangular spines (Fig. 23); 19 spines on penultimate whorl and 20 spines on last whorl; a strong, erect, carina appearing at mid-shoulder slope; carina clearly visible in shell profile, creating a deep concave area adapically. Suture shallow, rather inconspicuous. Axial ornamentation composed of adaperturally arcuate growth lines between mid-shoulder carina and suture, strong oblique ribs between mid-shoulder carina and end of spines, and crowded, weaker axial threads below keel. Spiral ornamentation (other than mid-shoulder carina) absent on shoulder slope; numerous, low, conspicuous spiral cords appearing below keel, stronger adapically, becoming corrugated as they cross axial ornamentation (Fig. 24), covering entire surface of last whorl. Sinus U- shaped, deep, occupying entire surface between mid-shoulder carina and suture. Total length of aperture 13.8 mm; length of siphonal canal approximately 7.3 mm; a thin, short, white, smooth columellar callus appearing at level of keel; spiral ornamentation showing through surface anterior to callus. Shell yellowish tan, with three slightly darker spiral bands on last whorl: one below keel, one at posterior end of siphonal canal, and one at mid-canal; darker, slightly oblique, axially oriented dashes appearing on shoulder, from edge of mid-shoulder to adapertural half of spines (Fig. 23), color also showing on abapical side of spines. Operculum unknown.

Discussion. The three paratypes from Barbados are bleached white, but all three show faint remnants of the three spiral bands on the dorsal side of the last whorl, and the largest shows faint tan markings on several of the spines on the keel of the last whorl. Otherwise, the three paratypes show all pertinent characters of the holotype.

The broadly pagodiform shape of *Cochlespira leeana* differentiates it from the slender profile of the Atlantic species *Cochlespira elegans* (Fig. 5), *C. elongata* (Fig. 4) and *C. cavalier* n. sp. (Figs 12-13). The new species is most similar to *Cochlespira radiata*; however, the latter has different markings, has a more glossy, thinner, more translucent shell, weaker axial ornamentation between mid-shoulder carina and keel, less numerous spines on peripheral keel (compare Figs 19 and 23), and spiral threads that are "less crowded near the keel" (Dall, 1989: 78) (compare Figs 20 and 24). Although it has been reported living throughout the arch of the Lesser Antilles down to Barbados (Rosenberg, 2009), *Cochlespira radiata* was not reported from Colombia by Díaz & Puyana (1994: 219) or from Venezuela by Macsotay & Campos (2001).

Cochlespira leeana can also be mistaken with *C. cedonulli* (Fig. 11), from the Panamic Province. The overall coloration and general structure of both species are very similar, but *C. cedonulli* has a solid tan coloration, instead of the specific bands and dashes of *C. leeana*, has fewer, more widely-triangular spines, and an almost smooth surface.

Etymology. Named for Dr. Harry G. Lee, of Jacksonville, Florida, well-known shell collector and author of many malacological publications. Dr. Lee brought the new species to my attention and donated the holotype.

ACKNOWLEDGEMENTS

My thanks to Mrs. Lauretta Marr, of Johnson City, Tennessee, and Mr. Al Deynzer, of Sanibel, Florida, for donating the type material for this study. My special thanks to Dr.Harry G. Lee, of Jacksonville, Florida, for donating the type material of *Cochespira leeana* and *C. cavalier*, as well as for allowing me to study his *Cochlespira* collection. Dr. Luiz Ricardo L. Simone, Museu de Zoologia da Universidade de São Paulo, and Mr. John Tucker, Illinois Natural History Survey, provided requested literature.

REFERENCES

Dall, W. H. 1889. Reports on the results of dredgings, under the supervision of Alexander Agassiz, in the Gulf of Mexico (1877-78) and in the Caribbean Sea (1879-80), by the U. S. Coast Survey Steamer 'Blake,'. *Bulletin of the Museum of Comparative Zoology* 18: 1-492, pls. 10-40.

Díaz, J. M. and Puyana, M. 1994. *Moluscos del Caribe Colombiano.* Colciencias y Fundación Natura Colombia: Santa Fé de Bogotá, 291 pp., [8] + 78 pls.

García, E.F. 2001. A remarkable deep-water *Cochlespira* from Golfo de Chiriquí, southwestern Panamá. *The Festivus* 33(3): 23-24.

Macsotay, O. and Campos Villarroel, R. 2001. Molucos representativos de la Plataforma de Margarita - Venezuela. Editora Rivolta: Valencia,Venezuela. [iii], iii, 280 pp., 32 pls.

Rosenberg, G. 2009. *Malacolog 4.1.1: A Database of Western Atlantic Marine Mollusca. [WWW database (version 4.1.1)] URL http://www.malacolog.org/.*

Simone, L. R. L. 1999. The anatomy of *Cochlespira* Conrad (Gastropoda, Conoidea, Turridae) with a description of a new species from the southeastern coast of Brazil. *Revista Brasileira de Zoologia* 16: 103-115.

Découverte de *Gundlachia radiata* (Guilding, 1828) (Mollusca: Planorbidae) en Guyane française

Simon CLAVIER
HYDRECO, Laboratoire Environnement de Petit Saut
B.P 823 / 97388 Kourou cedex, Guyane
simon.clavier@hydrecolab.com

Jean-Pierre POINTIER
USR 3278 CNRS-EPHE CRIOBE, Université de Perpignan
66860 Perpignan cedex, France
pointier@univ-perp.fr

David MASSEMIN
77, allée du Lac Bleu / 97320 Saint-Laurent du Maroni, Guyane
yoda.massemin@wanadoo.fr

KEYWORDS. French Guiana, Maroni River, *Gundlachia radiata.*

MOTS CLÉS. Guyane, Maroni, *Gundlachia radiata.*

ABSTRACT. A freshwater Pulmonate species identified as *Gundlachia radiata* (Guilding, 1828) was collected in Litani stream at the Apsik Icholi locality, upper Maroni River, French Guiana. This new record for the Guianan shield and French Guiana brings the number of freshwater-molluscs species from this French overseas territory to25 and extended the distribution area of *G. radiata* to the Guiana Plateau.

RÉSUMÉ. Plusieurs spécimens de mollusques dulçaquicoles identifiés comme *Gundlachia radiata* (Guilding, 1828) ont été collectés en Guyane française dans la rivière Litani, au lieu-dit Apsik Icholi sur le Haut-Maroni. Cette découverte porte à 25 le nombre d'espèces de mollusques d'eau douce répertoriés en Guyane et élargit significativement l'aire de distribution connue de *G. radiata* en direction du Plateau des Guyanes.

INTRODUCTION

Le Plateau des Guyanes s'étend sur quelques 1600 km de la côte nord-est du continent sud-américain, entre l'estuaire des fleuves Orénoque à l'ouest et Amazone à l'est. Cette région naturelle sous climat équatorial regroupe, d'ouest en est, une partie du Venezuela, la Guyana, le Surinam, la Guyane française et la région de l'Amapa au Brésil. La Guyane se situe entre 2° et 6° de latitude nord ; elle s'étend sur presque 84 000 km^2 dont plus de 80% sont sous couvert forestier. Ce département d'outre mer fait partie des 15 derniers grands massifs de forêt tropicale du monde qui ne sont que partiellement touchés par les activités humaines (Gargominy, 2003). La forêt tropicale humide s'y développe sur un ensemble de petites collines arrondies parcourues d'un réseau dense de rivières présentant des eaux en majorité acides. Ce dense complexe hydrographique alimente de larges fleuves, presque parallèles entre eux dans leur course jusqu'à l'océan, aux faciès rhéophiles au niveau de seuils rocheux (de Granville et al. 1993).

Les mollusques dulçaquicoles ont été peu étudiés à l'échelle du Plateau des Guyanes (voir notamment Drouët, 1859 et Tillier, 1980), jusqu'à l'édition récente d'un guide de reconnaissance des espèces (Massemin et al. 2009), recensant 24 espèces, réparties entre 6 familles. Toutefois, en l'absence de méthodologie de collecte particulière, les connaissances sur la malacofaune des eaux continentales demeurent fragmentaires (Massemin et al. 2009).

MATERIEL ET METHODES

Dans le cadre d'une étude commanditée par la Direction régionale de l'environnement de Guyane - service décentralisé du ministère en charge de l'environnement (Directive Cadre Européenne sur l'eau, DCE), une mission hydrobiologique a été organisée par le laboratoire HYDRECO sur le Haut-Maroni, au niveau de la rivière Litani (Fig. 1) ; des échantillonnages de la macrofaune aquatique - au sens de Rosenberg & Resh (1993) - ont été conduits par l'un des auteurs (SC), le 8 septembre 2009, au lieu-dit

Apsik Icholi (02°59'10" nord ; 54°10'53" ouest). Les collectes ont été réalisées à l'aide du filet troubleau d'un vide de maille de 200µm ; la surface d'embâcles des végétaux a été raclée à une profondeur de 20cm. La période d'échantillonnage correspondait à un régime hydraulique d'étiage de saison sèche.

RESULTATS

Cinq spécimens vivants du gastéropode *Gundlachia radiata* (Guilding, 1828) ont été collectés par SC (Fig. 3) et identifiés *a posteriori* par l'un des auteurs (JPP), avant d'être conservés, parties molles comprises pour d'éventuelles études anatomiques ou moléculaires à venir, et placés pour partie en collections publique (EPHE, Perpignan) et privée (HYDRECO, Guyane). Les critères de diagnose retenus relèvent de la forme caractéristique de la coquille (ancyliforme) et de l'aire d'insertion du muscle droit, du type d'apex et de l'espacement des stries radiales (Pointier, 2008). Sous certaines conditions du milieu naturel, des individus observés aux Petites Antilles présentent une forme inhabituelle (« *septate form* » - Pointier, 2008), non retrouvée chez les spécimens de Guyane.

Les eaux échantillonnées, chaudes (28,5°C) et légèrement acides (pH 6,8), étaient peu conductrices (21µS/cm), peu turbides (2,2 NTU) et bien oxygénées (6,9/90 mg/L%).

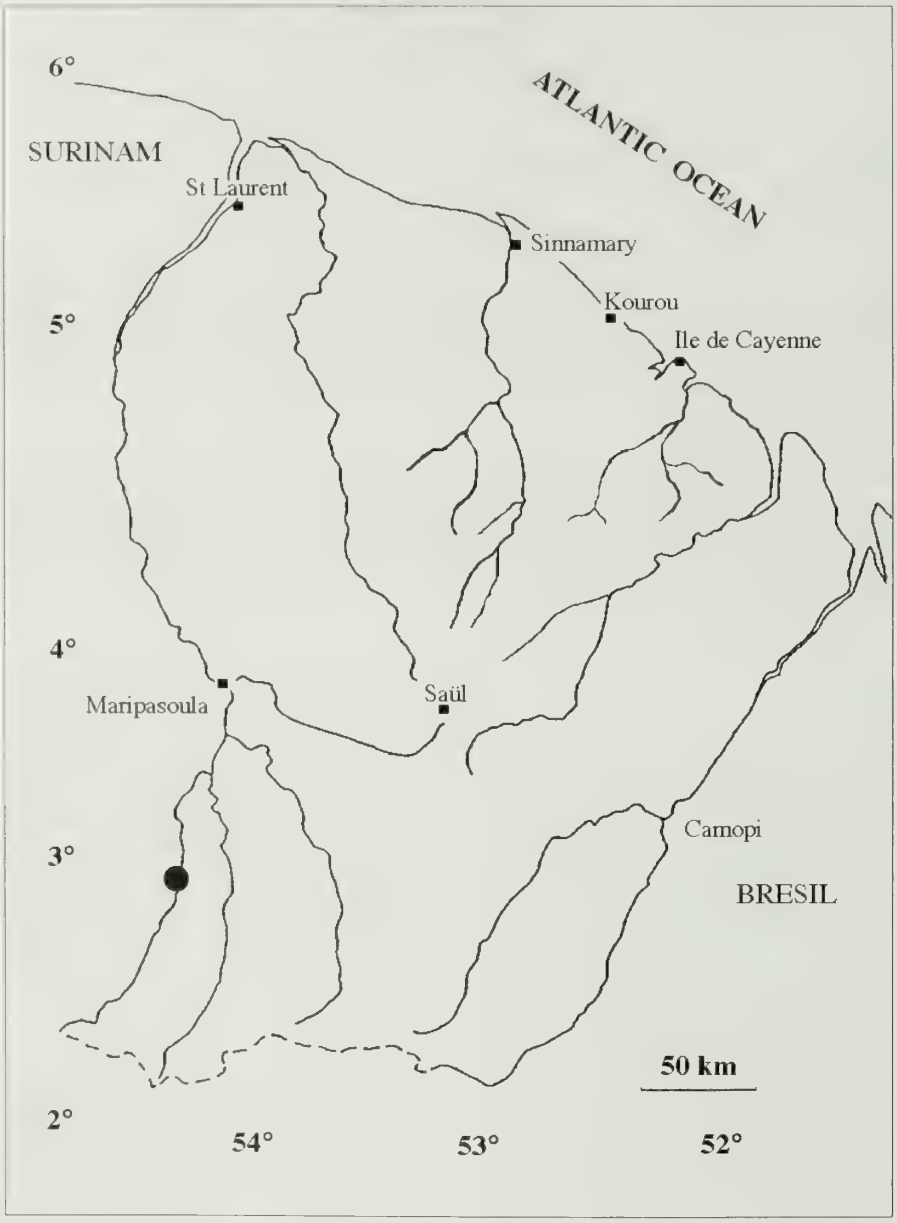


Figure 1. Localisation du site d'étude

DISCUSSION

Bien que la synonymie de *G. radiata* demeure sujette à discussion - synonymie possible avec *G. excentrica* (Morelet, 1851) et *Hebetancylus providentialis* (Wurtz, 1951), voir notamment à ce sujet les travaux de Hubendick (1967), Lanzer (1996), Simone (2006) et Wurtz (1951) -, l'aire de distribution de l'espèce semble relativement bien connue. Ainsi, *G. radiata* est une espèce inféodée à l'Amérique du Sud tropicale (Hubendick 1967), *a priori* absente des Andes et des parties les plus méridionales du continent (Lander, 1996). Inversement, ce mollusque est largement répandu en Amérique Centrale continentale (Brésil [Serra do Mesa, Etat de Goiás], Colombie, Guatemala, Honduras, Mexique, Nicaragua, Panama, Porto-Rico, Etats-Unis [Géorgie et Texas] et Venezuela) ainsi que dans les iles (Antigua, Bahamas, Cuba, Grenade, Guadeloupe, Jamaïque, Martinique, République Dominicaine, St Vincent [localité type], Ste Lucie et Trinidad) – voir notamment Aguayo (1938 & 1966), Crosse (1891), Goodrich & Van Der Schalie (1937), Guyard & Pointier (1979), Harrison (1983), Harry & Hubendick (1964), Hubendick (1964), Irmler (1975), Lanzer (1996), Malek (1986), Pointier (1976 & 2008), Pointier et al. (2005), Smith (1895) et Thiengo et al. (2005).

L'aire de distribution naturelle de *G. radiata*, qui semblait jusqu'alors exclure le Plateau des Guyanes, peut désormais être élargie dans sa direction (Fig. 2). Par ailleurs, il est fort probable que l'espèce y soit mieux représentée que ne le laisse suggérer sa découverte si récente et sa relative rareté naturelle (Wesselingh, 2006). Effectivement, de taille relativement petite - habituellement moins de 5 mm (Pointier et al. 2005), parfois jusqu'à 8 mm (Pointier, 2008) - elle est difficilement décelable par observation directe dans les eaux riches en acides humiques, et donc colorées. En outre, *G. radiata* semble affectionner des habitats largement répandus à l'échelle du Plateau des Guyanes : troncs flottants ou submergés, débris divers, feuilles mortes et végétation aquatique à une profondeur comprise entre 0 et 80 cm - voir notamment Pointier (2008) pour les Petites Antilles, Pointier et al. (2003) pour Cuba et Naranjo Garcia (2003) pour le Mexique.

Cette nouvelle donnée porte à 25 le nombre de mollusques dulçaquicoles répertoriés à ce jour en Guyane. Un effort d'échantillonnage adapté, à l'aide du filet troubleau notamment, et des méthodologies de collecte standardisées permettront de mieux appréhender, à l'avenir, la diversité spécifique de la malacofaune dulçaquicole de ce territoire et, plus généralement, du Plateau des Guyanes.

REMERCIEMENTS

Simon Clavier remercie la direction de la DIREN 973, commanditaire de l'étude, ainsi que Laurent Guillemet, Thomas Pagnon et Philippe Cerdan (HYDRECO, Guyane).

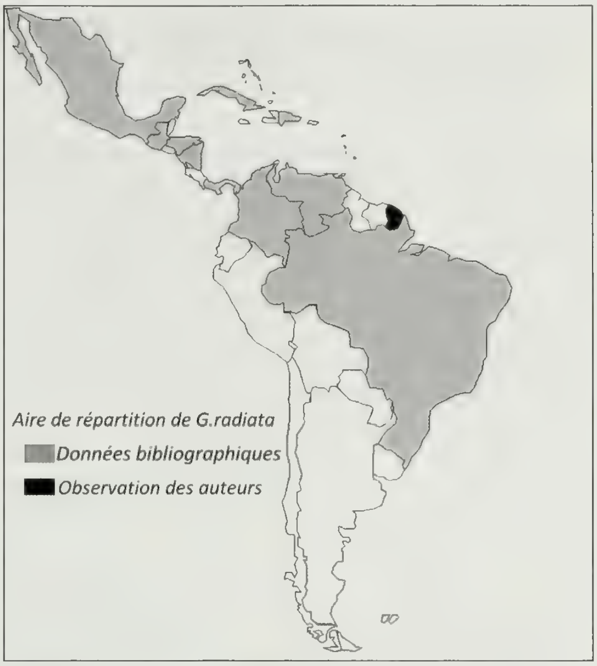

Aire de répartition de G.radiata
▨ Données bibliographiques
■ Observation des auteurs

Figure 2. Aire de distribution connue de *Gundlachia radiata*

REFERENCES

Aguayo, C.G. 1938. Los moluscos fluviatilis cubanos. *Memorias de la Sociedad Cubana de Historia Natural* 12 (3): 203-242.

Aguayo, C.G. 1966. Una lista de los moluscos terestres y fluviatilis de Puerto Rico. *Stahlia* (5): 89-105.

Crosse, H. 1891. Faune malacologique terrestre et fluviatile de l'île de Saint Domingue. *Journal de Conchyliologie* 39: 69-211.

Drouët, H. 1859. Essai sur les mollusques terrestres et fluviatiles de la Guyane Française. *Extrait des Mémoires de la Société Académique de l'Aube*. XXIII : 116 p., 4pl.

Gargominy, O. 2003. Biodiversité et conservation dans les collectivités françaises d'outre-mer. *Collection Planète Nature*. Comité français pour l'UICN, Paris, France. 246p.

Goodrich, C. & Van Der Schalie, H. 1937. Mollusca of Péten and North Alta Vera Paz, Guatemala. *Miscellaneous Publications Museum of Zoology University of Michigan* 34: 1-50.

Granville, J.-J. de, Cremers, G., Hoff, M., Lescure, J. & Tostain, O. 1993. Les zones humides de Guyane. Ed. Sepanguy, Cayenne. 52p.

Guyard, A. & Pointier, J.-P. 1979. Faune malacologique dulçaquicole et vecteurs de la Schistosomiase intestinale en Martinique. *Annales de Parasitologie Humaine et Comparée* 54 (2): 193-205.

Harrison, A.D. 1983. Identity of *Ferrissia irrorata* and *Gundlachia radiata*, Guilding's species of Ancylidae from St. Vincent, W. I. (Gastropoda: Pulmonata). *Archiv Mollusk* 113 (1/6): 7-15.

Harry, H.W. & Hubendick, B. 1964. The freshwater pulmonate Mollusca of Puerto Rico. *Meddelanden fran Goteborgs Musei Zoologiska Afdeling* 136: 1-73.

Hubendick, B. 1964. Studies on Ancylidae: the subgroups. *Meddelanden fran Goteborgs Musei Zoologiska Afdeling* 137: 1-72.

Hubendick, B. 1967. Studies on Ancylidae. The Australian, Pacific and Neotropical formgroups. *Acta Regiae Societatis Scientiarum et Litterarum Gothoburgensis. Zoologica* 1: 5-52.

Irmler, U. 1975. Ecological studies of aquatic soil invertebrates in three inundation forests of Central-Amazonia. *Amazoniana* 5: 337-409.

Lanzer, R. 1996. Ancyllidae (Gastropoda, Basommatophora) na América do Sul: sistemática e distribuição. *Revista Brasileira de Zoologia* 13 (1) : 175-210.

Malek, E.A. 1986. Freshwater and terrestrial snails of Saint Lucia, West Indies. *The Nautilus* 100 (4): 143-147.

Massemin, D., Lamy, D., Pointier, J.-P. & Gargominy, O. 2009. Coquillages et escargots de Guyane. Seashells and snails from French Guiana. Biotope, Mèze (Collection Parthénope) ; Muséum national d'histoire naturelle, Paris, 456p.

Naranjo Garcia, E. 2003. Moluscos continentales de México : Dulceaucuicolas. *Revista de Biologia Tropical* 51 (Suppl. 3) :495-505.

Pointier, J.-P. 1976. Répartition locale et biogéographie des mollusques dulçaquicoles de la Guadeloupe (Antilles Françaises). *Malacological Review* 9 (1/2): 85-103.

Pointier, J.-P. 2008. Guide to the Freshwater Molluscs of the Lesser Antilles. ConchBooks, Hackenheim, Germany, 128p.

Pointier, J.-P., Yong, M. & Gutiérrez, A. 2005. Guide to the Freshwater Molluscs of Cuba. ConchBooks, Hackenheim, Germany, 120p.

Rosenberg D.M. & Resh V.H. 1993. Freshwater bio monitoring and benthic invertebrates. Chapman and Hall, London and New York, 488p.

Simone, L.R. 2006. Land and freshwater mollusks of Brazil. EGB, Fadesp, Sao Paulo, 390p.

Smith, E.A. 1895. A list of land and freshwater Mollusca of Trinidad. *Journal de Conchyliologie* 8: 231-245.

Thiengo S.C., Santos S.B. & Fernandez M.A. 2005. Malacofauna límnica da área de influência do lago da usina hidrelétrica de Serra da Mesa, Goiás, Brasil. I. Estudo qualitativo. *Revista Brasileira de Zoologia* 22 (4): 867-874.

Tillier, S. 1980. Gastéropodes terrestres et fluviatiles de Guyane française. *Mémoires du Muséum National d'Histoire Naturelle*. Nouvelle série. Série A, Tome 118. Paris.

Wesselingh, F.P. 2006. Molluscs from the Miocene Pebas Formations of Peruvian and Colombian Amazonia. *Scripta Geologica*, 133: 199-290.

Wurtz, C.B. 1951. Catalogue of Ancylidae of South and Central America and the West Indies, with description of new species. *The Nautilus* 64 (4): 123-131.

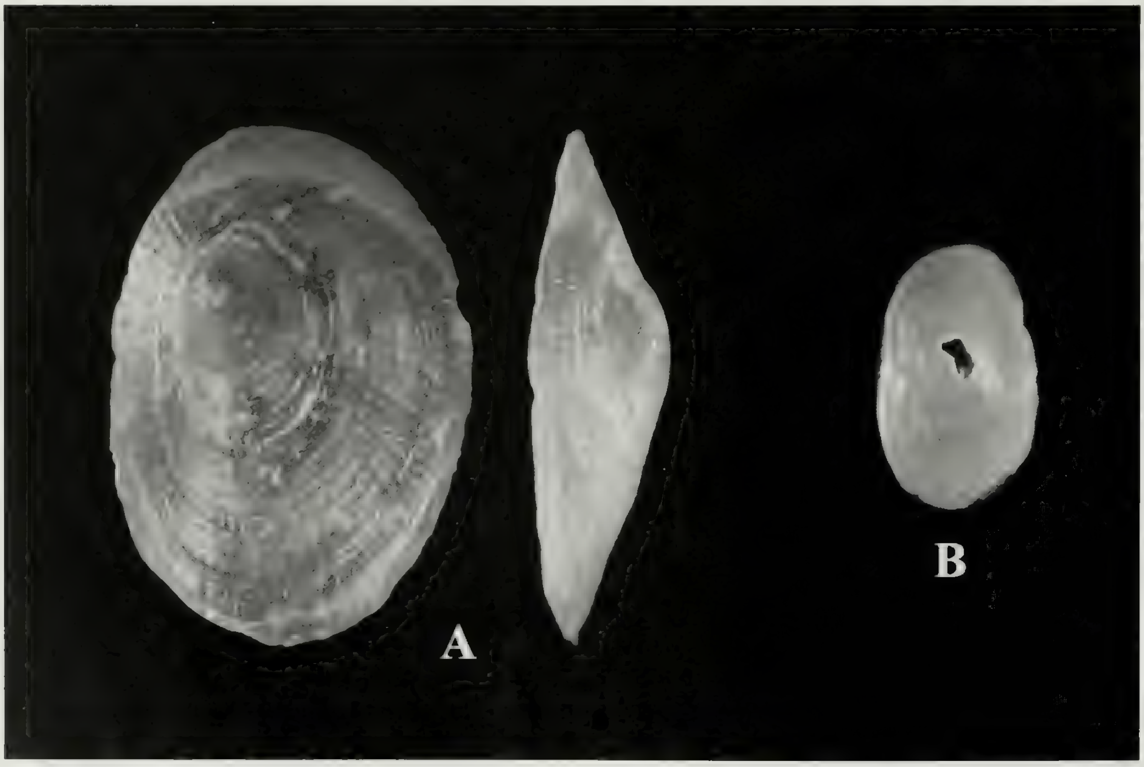


Figure 3. *Gundlachia radiata* : **A.** Guadeloupe coquille vue de dos et de profil (6mm); **B.** Guyane coquille vue de dos (2mm).

A new species of *Mitromica* (Gastropoda: Costellariidae) from Nicaragua

Emilio ROLÁN
Museo de Historia Natural,
Campus Universitario Sur,
15782 Santiago de Compostela, Spain

Raúl FERNÁNDEZ-GARCÉS
Centro de Estudios Ambientales de Cienfuegos (CEAC),
División de Gestión Ambiental (DGA),
calle 17, esquina Ave. 46, Cienfuegos, Cuba

Harry G. LEE
4132 Ortega Forest Drive, Jacksonville,
FL 32210, USA

KEYWORDS. Gastropoda, Cancellariidae, *Mitromica*, Nicaragua, new species.

ABSTRACT. A new species of *Mitromica* is described from Miskitos Cay, Nicaragua, making comparison with those more close.

INTRODUCTION

In January 1997, a research trip to study the marine biodiversity of the Miskitos Cays, Nicaragua, was organized by the Universidad Autónoma of Madrid. In the examination of the material collected during this expedition shells of a costellariid species considered new to science was encountered. It is described in the present work.

The gastropod family Costellariidae is represented in the Caribbean, and various species are figured in Abbott (1974), Petuch (1987) and Vokes & Vokes (1984). The genus *Mitromica* Berry, 1958 and the related *Thala* were critically studied by Rosenberg & Salisbury (2003).

Abbreviations

BMNH: The Natural History Museum, London
MNHN: Muséum national d'Histoire naturelle, Paris
MHNS: Museo de Historia Natural, University of Santiago de Compostela
MNCN: Museo Nacional de Ciencias Naturales, Madrid

SYSTEMATICS

Family **COSTELLARIIDAE** MacDonald, 1860
Genus ***Mitromica*** Berry, 1958

Mitromica gallegoi spec. nov.
Figs 1-5

Type material. Holotype (Figs 1-3) in the MNCN (15.05/53.570). Paratypes in the following collections: MNHN(1, Fig. 4), BMNH (1), IES (1), MHNS (2).

Type locality. Witties Cay, Miskitos Cays, Nicaragua, 30 m.

Description. Shell (Figs 1-4) solid, elongate, white, with a reticulate surface. Protoconch (Fig. 5) prominent, smooth, polished, with a narrow nucleus of only one whorl about 550-600 µm in diameter. Teleoconch with about 5 rapid expanding whorls bearing spiral cords, 3 on the first two whorls, 4-5 on the next, 6 on the penultimate and between 14-17 on the body whorl: 5-7 above the suture and about 9-10 below. Axial sculpture about 7 orthocline ribs on early whorls and 20-22 on the body whorl. Ribs are stronger than cords. Aperture elongate, columella vertical in its central portion, where 4 folds are evident.

Dimensions: the holotype measures 7.4 mm. The paratypes are slightly smaller.

Distribution. Only known from the type locality. Probably endemic to the area.

Remarks. Comparison of the new species must be made with members of the Mitroidea occurring in the region and possessing elongate shells with reticulate sculpture:

Nodicostellaria kremerae Petuch, 1987 was collected in the Venezuela Gulf, is larger (18 mm), slightly shouldered, and the colour is not white but irregular tan.

Nodicostellaria lixa (Petuch, 1979) was described from the Abrolhos Archipelago, the holotype measures 12 mm, the sculpture is finer, the shell not so elongate, and the colour is white, becoming pink on the anterior-central portion of the body whorl.

Turricostellata leonardhilli Petuch, 1987, is larger (18 mm), the shell is as distinctly reticulate, and the colour is not white but yellow or orange on the anterior-central body whorl. It was collected in Colombia and Venezuela.

Mitra antillensis Dall, 1889 is a very large shell (up to 75 mm) being collected in deep water (up to 600 m).

Vexillum styria Dall, 1889 is small, about 12 mm, but has 10 whorls. 5 folds on the columella and 10 whorls. The protoconch is pointed and multispiral.

Mitra straminea A. Adams, 1854 (= *multilirata* A. Adams, 1853) is larger (20-28 mm), the colour is not white (but with brown stripes), with 14-18 spiral cords, and the aperture is half of the shell height.

Mitromica williamsae Rosenberg & Salisbury, 2003 has a similar size, the protoconch has 1.7-1.8 whorls, being smaller in width (0.43-0.48 mm). This species has more axial ribs (26-37 on last whorl) and more spiral cords (24-29 on last whorl).

Mitromica calliaqua Rosenberg & Salisbury, 2003 has a brown shell, the ribs on the last whorl are 25-31, and the spiral cords number 17-22. The protoconch is 0.43 mm (it is not thus characterized in the original description but deduced from the figure).

Mitromica dicksoni Rosenberg & Salisbury, 2003 is yellowish tan in colour, scarcelly larger (the holotype and paratype represented in the original description measure about 7.3-7.7 but they have broken apex and expected to get 8 or more mm); the body whorls are more globose, with a greater number of axial ribs (33-36) and cords (in the figure of the holotype can be counted towards the base about 25). The ribs and cords are of similar size.

Mitromica esperanza (Leal & Moore, 1993) is smaller, yellowish to brown in colour, with more numerous ribs and cords.

Mitromica foveata (G.B. Sowerby II, 1874) is proportionally wider and smaller, very variable in colour, and with the ribs and cords proportionately wider.

Etymology. After Pedro Pablo Gallego, Dean of the Faculty of Biology, University of Vigo.

REFERENCES

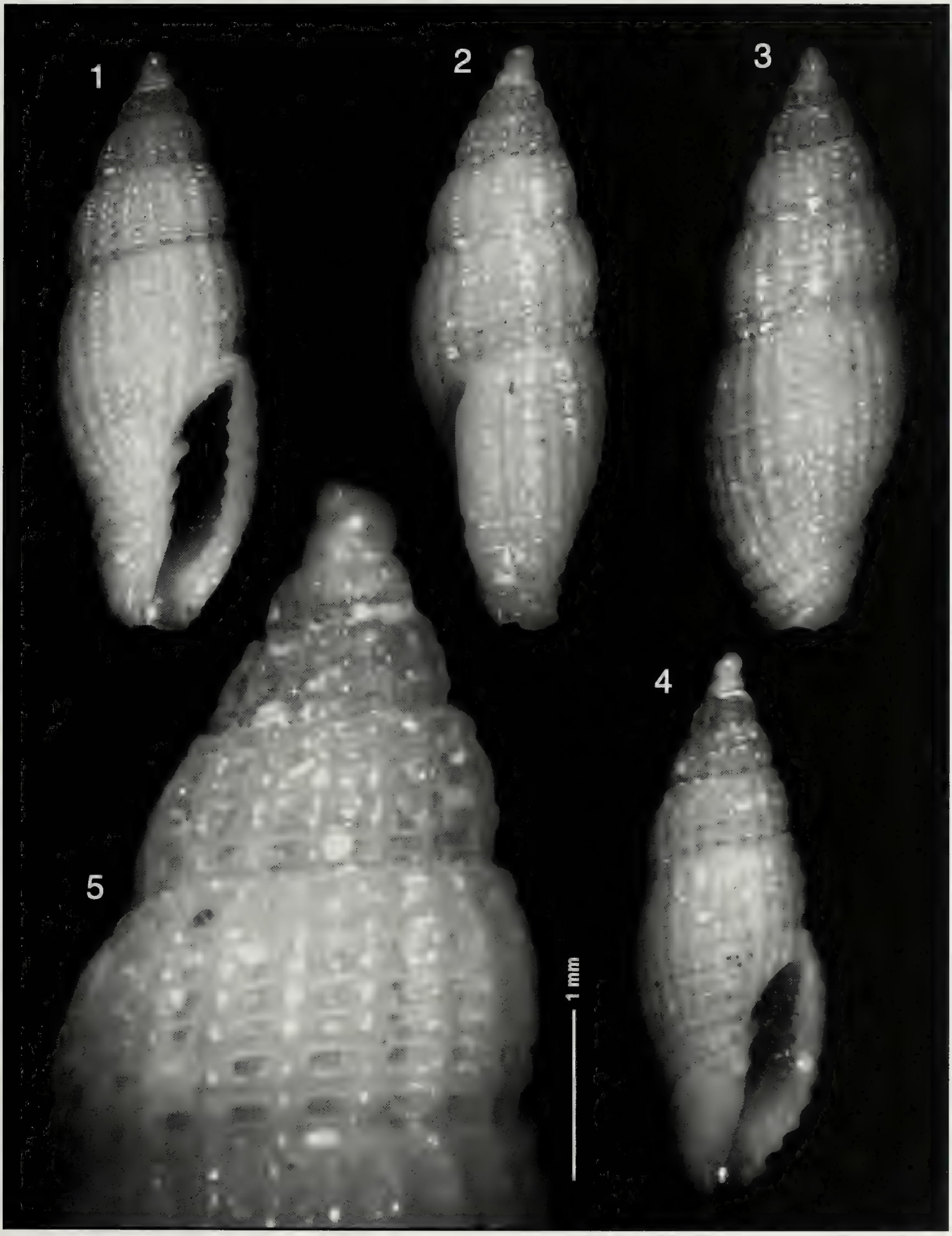
Abbott, R. T. 1974. *American Seashells*. Van Nostrand Reinhold Company, New York. 663 pp., 24 pls.

Petuch, E. J. 1987. *New Caribbean Mollusca Faunas*. CERF, Charlottesville, Virginia. 154 pp.

Rosenberg, G. & Salisbury, R. 2003. On *Mitromica* and *Thala* (Gastropoda: Costellariidae) with descriptions of new species from the Western Atlantic and the Indo-Pacific. *Notulae Naturae*, 478: 1-30.

Vokes, H. E. & Vokes, E. H. 1984 “1983”. Distribution of shallow-water marine Mollusca, Yucatan Peninsula, Mexico. *Mesoamerican Ecology Institute, Monograph 1*: 1-183, 50 pls.

Figures 1-5. *Mitromica gallegoi* spec. nov.
1-3. Holotype, 7.4 mm, Witties Cay, Nicaragua (MNCN);
4. Paratype, 7.0 mm, type locality (MNHN);
5. Protoconch of the holotype.


1
2
3
4
5
1 mm

A new species of *Malea* (Mollusca: Tonnoidea) from the Lower Miocene Cantaure Formation of Venezuela

Bernard LANDAU
Centro de Geologia da Universidade de Lisboa, Campo Grande,
1749-016 Lisboa, Portugal
and International Health Centres, Av. Infante de Henrique 7, Areias São João,
P-8200 Albufeira, Portugal
bernielandau@sapo.pt

Abstract A new species of *Malea* (Tonnoidea, Mollusca) is described from the Lower Miocene Cantaure Formation of the Paraguaná Peninsula (Venezuela). The very endemic nature of the *Malea* taxa found in the Neogene Colombian-Venezuelan-Trinidad Subprovince of the Gatunian Province is highlighted, with more than half of all the known Tropical American species restricted to this subprovince.

Keywords: Tonnoidea, Mollusca, *Malea*, Miocene, Cantaure Formation, Venezuela, new species

INTRODUCTION

The molluscan fauna of the late early Miocene (Burdigalian) shellbeds at Cantaure, on the Paraguana Peninsula, Falcón, Venezuela, was described by Jung (1965). However, numerous other taxa have been collected from this very diverse locality subsequently. The largest collection is that made by Jack and Win Gibson-Smith, now housed in the Naturhistorisches Museum Basel, Switzerland. The author has also visited the locality on several occasions to collect fossil gastropods; some of this material remains in my private collection (BL coll.) and some has been presented to the Naturhistorisches Museum Wien.

In his recent revision of tropical American Neogene tonnoideans, Beu (2010) figured and discussed the shell studied here, but did not describe it formally, as it is the only known specimen. Despite two further visits to Cantaure, no further tonnid shells have been found. In view of the rapid deterioration of the "upper bed" exposure (sensu Gibson-Smith & Gibson-Smith 1979) (BL personal observation) we are unlikely to find further specimens in the near future. As part of this series of papers formally describing the taxa found in the Cantaure assemblage (Landau & Vermeij 2010) we take the opportunity of describing this unusual and important taxon.

Material and Methods

The specimen described here was found by me in 2005, and is now deposited in the Naturhistorisches Museum Wien (NHMW coll.), Vienna.

SYSTEMATIC PALAEONTOLOGY
PHYLUM MOLLUSCA
CLASS GASTROPODA

SUPERFAMILY **TONNOIDEA** Suter, 1913 (1825)
Family **TONNIDAE** Suter, 1913 (1825))
Genus ***Malea*** Valenciennes, 1883

Malea maxwelli n. sp.
Figs 1, 2

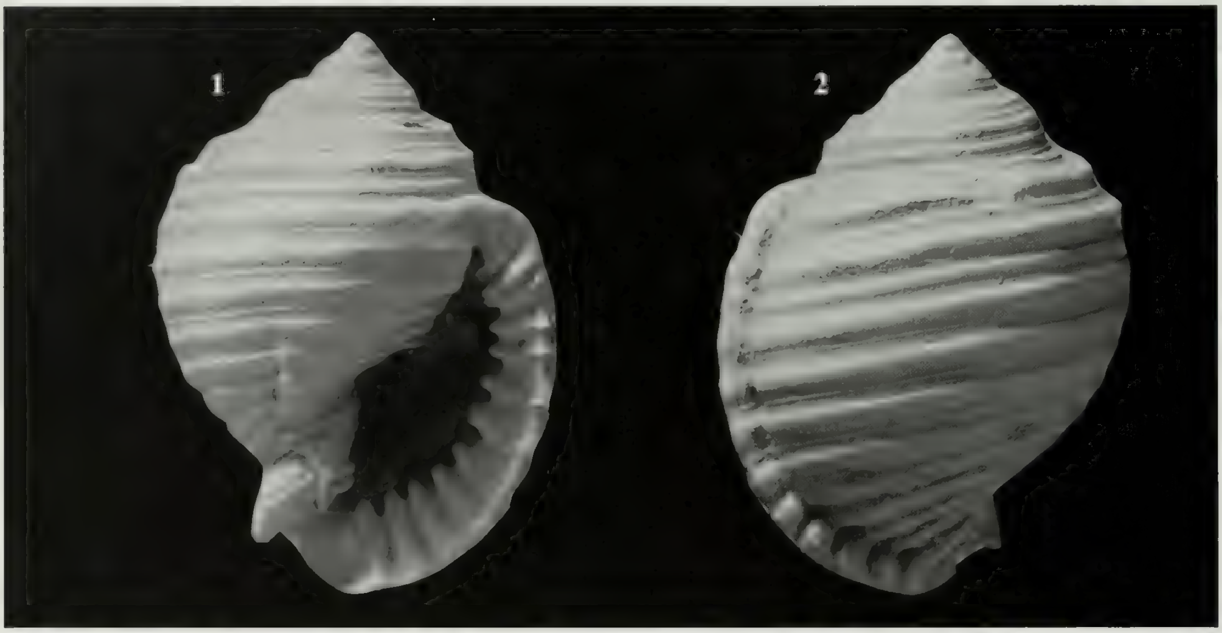
Malea n. sp. A Beu 2010, p. 262, pl. 77, figs 3, 4.

Type material and dimensions. Holotype NHMW 2009z0075/0001, height 36.8, width 26.7 mm (Figs 1, 2).

Type locality. Cantaure Formation (early Miocene: Burdigalian), upper shell bed (of Gibson-Smith & Gibson-Smith 1979), 1 km SW of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela.

Diagnosis. A *Malea* species with a very small shell, an evenly rounded last whorl, spiral sculpture of relatively narrow, elevated primary cords with 2 secondary threads in each interspace, and a well-developed parietal ridge on the inner lip callus pad.

Description. Shell very small and relatively solid for genus, globose, with short spire. Protoconch eroded. Teleoconch of five convex whorls, with periphery at the abapical suture on spire whorls. Suture impressed, very narrowly canaliculate. Spiral sculpture of relatively narrow, rounded spiral cords, three on spire whorl, 11 on last whorl, separated by interspaces each somewhat wider than one cord, bearing two narrow spiral threads in each interspace. Weaker subsutural cord present on last three whorls, followed abapically by narrow, slightly concave sutural ramp delimited by first primary spiral cord. Axial sculpture of close-set, prosocline growth lines, especially strong on early whorls. Last whorl 83% total height, globose, evenly rounded, constricted at base. Aperture elongate, narrow, widening abapically. Outer lip thickened by narrow but prominent labial varix, somewhat flared abapically. Lip slightly concave, beveled inwards, bearing 13 narrow lirae that extend right across beveled inner part of the lip. Lirae form sharp denticles crenulating both inner and outer edges of lip. Second and third denticles more closely set than others, almost fused; mid-apertural denticle thicker than others. Anal canal narrow, deep; siphonal canal short, open, very wide, strongly abapically recurved. Parietal callus greatly expanded, sharply delimited, closely adherent. Parietal pad thickened over spiral cords adapically, forming well-defined parietal ridge. Adapical portion of columella convex, deeply excavated below. Abapical half of columella bearing several oblique folds and elongated denticles. Siphonal fasciole very short, rounded, abaxially recurved.



Figures 1-2

Malea maxwelli n. sp., holotype, NHMW 2009z0075/0001, height 36.8, width 26.7 mm; Cantaure Formation (early Miocene: Burdigalian), upper shell bed, Casa Cantaure, Paraguaná Peninsula, Falcón, Venezuela.

Discussion. Although represented by a single specimen, *Malea maxwelli* n. sp. is quite distinctive in having one or two obvious but narrow spiral threads in each primary spiral interspace, in having many low, narrow, sharply defined, rather widely spaced axial ridges over the entire teleoconch surface (as in *Eudolium* – Marshall 1992; and as in juvenile specimens of *Tonna galea* (Linnaeus, 1758)) and in having a well-defined parietal ridge, very prominent over the uppermost (most posterior) spiral cords on the inner lip callus pad, and visible as an angling ridge on the next three cords below that. *Malea maxwelli* n. sp. also has a very small shell for the genus, and it is possible that this is a aberrant small specimen. However, the shell illustrated (Figs 1, 2) appears to be fully mature. *Malea* shells tend to be fragile and often only fragments of the outer lip are found, but despite numerous field-trips to the Cantaure outcrop, I have never seen fragments of larger *Malea* shells. Although Beu (2010) recorded this shell as coming from the lower (main) shellbed (= NMB 17016) near Casa Cantaure, it was actually found in the "upper shell bed" of Gibson-Smith & Gibson-Smith (1979) in association with *Cymatophos paraguanensis* (Hodson, 1931), which only occurs in the "upper bed".

Malea maxwelli n. sp. is one of the earliest records of the genus from tropical America. Beu (2010) reported *Malea elliptica* Pilsbry & Johnson, 1917 from the coeval Baitoa Formation of the Dominican Republic. *M. elliptica* differs from *M. maxwelli* n. sp. in its more elongate, less globose last whorl, with the shoulder placed higher, the spiral cords are more close-set, and neither *M. elliptica* nor any other *Malea* species has the spiral threads present in the interspaces of the Cantaure shell. Moreover, the well-defined parietal ridge seen in *M. maxwelli* is far less developed in *M. elliptica*. *Malea maxwelli* is more similar in shell shape to *Malea camura* Guppy, 1866 from the Gurabo Formation, Upper Miocene of the Dominican Republic, but has an even more evenly rounded last whorl and again differs in the details of the spiral sculpture. *Malea camura* has a shorter and wider shell and more widely spaced primary spiral cords than *M. elliptica*. As in *M. elliptica*, the parietal ridge is also less developed than in *M. maxwelli*. *Malea goliath* Pilsbry & Johnson, 1917, which Beu (2010) recorded from the Caribbean Neogene from the late Lower

Miocene Baitoa Formation to the Pliocene Cayo Agua Formation, is immediately distinguished from the new taxon by having a very large, wide shell, with very wide, flat-topped spiral cords separated only by very narrow grooves. *Malea densecostata* (Rutsch, 1934) from the Lower Pliocene Punta Gavilán Formation of Venezuela is also easily distinguished, as the name would suggest, by its narrow, close-set spiral cords. Landau et al. (2008) discussed the endemic nature of the Neogene molluscan assemblages found in northern Venezuela, fully justifying the erection of the Colombian-Venezuelan-Trinidad Subprovince of Woodring (1974), which seems to have been in place since at least the early Miocene (Landau et al. 2008). The genus *Malea* illustrates this endemism clearly, with four of the nine species recorded by Beu (2010) from Neogene to Recent faunas of tropical America endemic to the Colombian-Venezuelan-Trinidad Subprovince. *Malea* is also an example of a paciphile gastropod (see Woodring 1966; Landau et al. 2009), which according to the fossil record seems to have had its origins in the Atlantic portion of the Neogene Gatunian Province (Vermeij & Petuch 1986; Vermeij 2005; Landau et al. 2008) but now, within the American region, is limited to the eastern tropical Pacific.

Etymology. The species name commemorates Phil Maxwell, friend and guide to the wonderful fossil localities on the South Island of New Zealand.

REFERENCES

Beu A.G. 2010. Neogene tonnoidean gastropods of tropical and South America: Contributions to the Dominican Republic and Panama Paleontology Projects and uplift of the Central American Isthmus. Bulletins of American Paleontology 377-378: 1-550.

Jung P. 1965. Miocene Mollusca from the Paraguana Peninsula, Venezuela. Bulletins of American Paleontology 49(223): 387-644.

Landau B.M., Vermeij G.J. 2010. A new species of *Plicopurpura* (Mollusca: Rapaninae) from the Lower Miocene Cantaure Formation of Venezuela. Novapex 11 (4): 99-104.

Landau B.M., Vermeij G.J., Silva CM da 2008. Southern Caribbean Neogene palaeobiogeography revisited. New data from the Pliocene of Cubagua, Venezuela. Palaeogeography, Palaeoclimatology, Palaeoecology 257: 445-461.

Landau B.M., Vermeij G.J., Silva CM da 2009. Pacific elements in the Caribbean Neogene gastropod fauna: the source-sink model, larval development, disappearance, and faunal units. Bulletin de la Société Géologique de France 180: 249-258.

Vermeij G.J. 2005. One-way traffic in the western Atlantic: causes and consequences of Miocene to early Pleistocene molluscan invasions in Florida and the Caribbean. Paleobiology 31: 624-642.

Vermeij G.J., Petuch E.J. 1986. Differential extinction in tropical American molluscs: endemism, architecture, and the Panama land bridge. Malacologia 27: 29-41.

Woodring W.P. 1966. The Panama land bridge as a sea barrier. Proceedings of the American Philosophical Society 110: 425-433.

Woodring W.P. 1974. The Miocene Caribbean Faunal Province and its Subprovinces. Verhandlungen der Naturforschenden Gesellschaft in Basel 84: 209-213.

NOTE AUX AUTEURS

Conditions Générales. L'affiliation à la Société n'est pas obligatoire pour les auteurs. La publication des articles de maximum 12 pages imprimées en double interligne est gratuite. Au-delà de 12 par numéro, chaque page sera facturée au prix de 40,00 €. Les articles de taille supérieure peuvent être scindés sur plusieurs numéros.

Les numéros hors série sont publiés irrégulièrement. Les auteurs désireux de soumettre un article pour un numéro hors série (40 pages imprimées ou plus) sont priés de contacter auparavant la Société Belge de Malacologie à l'adresse ci-dessous.

Les articles décrivant de nouvelles espèces (sous-espèces) ne seront acceptés que si le matériel type primaire est déposé dans un Musée ou une Institution scientifique publique.

Les auteurs devront suivre strictement les règles du *Code de Nomenclature Zoologique* (quatrième édition).

Manuscrits. Les manuscrits seront rédigés en français ou en anglais. Ils doivent être dactylographiés, justifiés à gauche, avec double interligne, sur une seule face de papier A4 et sur une colonne. Les marges doivent être de 25 mm minimum. La séquence des sections respectera l'ordre suivant : titre, nom de(s) auteur(s), adresse(s) de(s) auteur(s), mots-clés et résumé en anglais (et éventuellement en français). Les noms de genre et des (sous) espèces seront en caractères *italiques*. Les références dans le texte auront la forme: Keen & Campbell (1964) ou (Keen & Campbell, 1964). **Consultez un numéro récent de Novapex pour l'organisation du texte.**

La liste des références, en ordre alphabétique, respectera la forme suivante (les titres des publications ne devraient pas être abrégés):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.

Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells.* William Collins Publishers Ltd: xiv + 500 pp.

Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.

Source Internet:

Auteur(s) 2007. Titre du site web ou de la base de données, nom de l'éditeur et localité (si indiquée), nombre de pages, adresse: http://www.... (date d'accès).

Illustrations. Les photographies doivent être de bonne qualité (couleur ou noir/blanc), imprimées sur papier brillant et montées sur un support adéquat dans le format final souhaité (max. 16 X 21 cm). Des photographies en couleur peuvent être soumises pour une reproduction en noir et blanc. Les illustrations peuvent également être fournies sur un support informatique (CD-ROM, ZIP) en format PSD (Photoshop) BMP, JPG ou TIFF avec mention du programme utilisé. Elle doivent être montées et ne peuvent contenir aucun texte, sauf la numérotation. Une version imprimée des planches doit être impérativement jointe au manuscrit.

Si plus d'une figure apparaît sur une planche ou/et dans le texte, TOUTES les figures doivent être numérotées consécutivement (Fig. 1, 2, 3...) ET PAS Fig 1A, 1B, 1C, NI planche 1, Fig. 1...

L'inclusion de planches couleurs est soumise à l'approbation du conseil d'administration qui prendra la décision finale. Les auteurs désireux d'inclure une ou plusieurs planches couleurs sont priés de se renseigner quant aux possibilités offertes et aux coûts.

Traitement des manuscrits. Les manuscrits seront soumis au conseil d'administration qui distinguera les articles d'intérêt scientifique et ceux d'intérêt général. Les décisions et les commentaires seront communiqués aux auteurs, qui en tiendront compte. La version corrigée devra être renvoyée à la Société Belge de Malacologie sous forme informatisée (en Word pour Windows) accompagnée d'un tirage sur papier. Elle devra respecter strictement les instructions de mise en page qui auront été communiquées aux auteurs. Une épreuve finale sera renvoyée aux auteurs pour correction.

Tirés-à-part. En ce qui concerne les articles d'intérêt scientifique, 30 exemplaires sont gratuits, jusqu'à concurrence de 240 pages maximum, si au moins un des auteurs est membre de la Société. Les exemplaires supplémentaires (min. 30 exemplaires) seront facturés au prix coûtant.

Pour les non membres, les tirés-à-part sont à charge des auteurs, au prix coûtant (minimum 30 exemplaires). Les frais de port sont toujours à charge des auteurs.

Les manuscrits et toute correspondance seront adressés à:
Société Belge de Malacologie, M. C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye, Belgique
ou par e-mail: vilvens.claude@skynet.be

NOTE TO AUTHORS

General conditions. Membership is not mandatory for authors. Publication of papers with a maximum of 12 double spaced printed pages is free of charge. Beyond 12, every page will be invoiced at the price of 40,00 €. Larger papers may be splitted on several issues.

Supplements are published irregularly. Authors wishing to submit papers for supplements (40 printed pages or more) are asked to contact the board previously at the address mentioned below.

Papers describing new species (subspecies) will be accepted only if the primary types are deposited in a recognized public Museum or scientific Institution.

The paper will be in accordance with the rules of the *International Code of Zoological Nomenclature* (Fourth edition)

Manuscripts. Manuscripts will be in English or in French. They must be typed on one column, ragged right (left-justified), double-spaced throughout, on one side only of A4. Margins must be at least 25 mm. The sequence of sections will respect the following order: title, name of author(s), address(es) of author(s), keywords and summary in English. Generic and (sub)specific names have to be typed in *italics*. References in the text should be given as follows: Keen & Campbell (1964) or (Keen & Campbell, 1964). **Refer to a recent issue of Novapex for the lay out.**

References, in alphabetic order, should be given in the following form (titles of journals should not be abbreviated):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.

Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells*. William Collins Publishers Ltd: xiv + 500 pp.

Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.

Internet resources.

Author(s) 2007. Title of the website or database, publisher name and locatiuon (if indicated), number of pages, address: http://www.... (date of access).

Illustrations. Photographs must be of a high quality (colour or black/white), printed on glossy paper in a final version (max. 16 X 21 cm), adequatly mounted. Colour work can be submitted for black & white production. The illustrations may be submitted as digital files (CD-ROM, ZIP) in BMP, JPG or TIFF format, with mention of the program. They must be adequately mounted with not any other text than the numbering. A printed version of the plates must be imperatively sent together with the manuscript.

If more than one figure is included in a plate or/and in the text, ALL figures must be consecutively numbered (Fig. 1, 2, 3...) NOT Fig 1A, 1B, 1C, NOR plate 1, Fig. 1...

Inclusion of colour plates has to be approved by the board who will take the final decision. Authors who want to include colour plates are invited to ask for possibilities and charges.

Processing of manuscripts. Manuscripts will be submitted to the board who will distinguish between the articles of scientific interest, and those of general aim. The comments will be communicated to authors, who will consider them. A diskette containing the corrected version should be sent back to the Belgian Malacological Society (in Word for Windows support) together with a printed copy. It should strictly follow the style instructions which will be communicated to the author(s).

Reprints. With regard to papers of scientific interest, 30 reprints are free of charge, representing a maximum of 240 pages, if at least one author is member of the Society. Additional copies (at least 30) will be invoiced at cost.

For non-members, the reprints (min. order 30 copies) will be billed to the author(s). Mailing costs are always to be paid by authors.

Manuscripts and any mail are to be sent to:
Société Belge de Malacologie, Mr. C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye, Belgium
or by e-mail: vilvens.claude@skynet.be

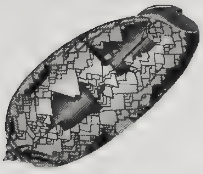
C. Delongueville, **R. Scaillet &** **C.M.L. Afonso**	Première signalisation de *Nassarius sesarmus* (Marrat, 1877) le long des côtes européennes de l'Atlantique Nord-Est (Algarve - sud du Portugal)	117
C. Vilvens avec **E. Meuleman,** **R. Wiliquet,** **B. Maree,** **J.-P. Coppée**	Les balades "A la découverte des escargots" (25 septembre 2010)	120
J.-P. Coppée	Etymologie et malacologie dans deux sites naturels du nord-est de Bruxelles – Troisième partie : les limaces	129
E.Meuleman & **C. Vilvens**	L'écho des réunions :	
	- Claude Vilvens, Etienne Meuleman et tous les autres : L'atelier Bernard l'Ermite	134
	- Christiane Delongueville : Le Svalbard	137
E. Meuleman	Nous avons reçu	138
C. Delongueville & **R. Scaillet**	Les grandes marées de 2011	153

Mollusks
NOV
S527

VIE DE LA SOCIETE

LIFE OF THE SOCIETY

MCZ
LIBRARY
2011
HARVARD
UNIVERSITY



Prochaines activités de la SBM

Claude VILVENS

Lieu de réunion : **Nouveau local ! A partir de 14h**.

Salle "Memling" (1er étage - ascenseur) - Rue de Genève, 470b – Schaerbeek (Bruxelles)

Tirant expérience de la réunion annulée en janvier 2010 pour cause de mauvaises conditions climatiques (souvenez-vous : neige, verglas, brouillard ☹),
la SBM fera relâche en janvier 2011.

***

SAMEDI 5 FEVRIER 2011

P. Vilvens : James Ensor et les coquillages

Le Baron James Ensor (1860-1949) fut un des plus grands peintres modernes belges. Ses œuvres sont marquées par Ostende , la mort , les masques ,… mais aussi par les coquillages (exotiques ou non) qu'il adorait et qu'il représenta dans plus d'une cinquantaine de très nombreuses œuvres, allant de 1882 à 1941. En plus de découvrir ces peintures,vous pourrez (re)découvrir l'artiste lui-même et son amour pour "ses beautés nacrées".

***

SAMEDI 19 MARS 2011

Tout le monde : ASSEMBLÉE GÉNÉRALE DE LA SBM.

-- Voir annonce officielle page suivante --

Le bilan, les projets, les souhaits, les critiques (pas trop quand même) ... Tout le monde a la parole !

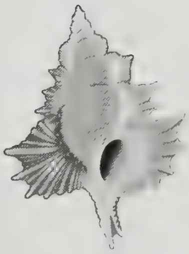
Nous vous attendons donc nombreux … d'autant que cette Assemblée générale se termine toujours par un petit verre ☺ … En effet, si il convient de rappeler l'importance de cette Assemblée, il faut aussi en souligner le côté convivial.

***

*Réservez déjà dans vos agendas le **30/4/2011** et le **18/6/2011**, sans oublier le **28/5/2011** (excursion).*

Joyeux Noël et très bonne année à tous !!!

Pour les informations de dernière minute :



Sur Internet :

une nouvelle adresse !

http://www.societe-belge-de-malacologie.be/

L'Assemblée Générale de la Société Belge de Malacologie

Conformément aux statuts de la Société Belge de Malacologie A.S.B.L.,une **Assemblée Générale** de l'Association se tiendra le samedi **19 mars 2011** à **14h** en son local de la Rue de Genève, 470b à Scharbeek - Bruxelles.

Ordre du jour

- Rapport moral
- Comptes de l'exercice 2010
- Prévisions budgétaires pour l'exercice 2011
- Election ou réélection d'administrateurs (les candidatures, démissions ou demandes de réélection doivent parvenir au Président actuel pour le 12 mars 2011 au plus tard).
- Publications de la Société
- Cotisations 2012
- Divers

Nos membres sont instamment priés d'assister à cette Assemblée Générale

Nous rappelons que, conformément à l'article 6 des statuts, tout membre peut se faire représenter par un autre membre, moyennant procuration écrite. Un seul mandataire ne peut cependant recevoir que trois mandats de l'espèce.

Pour le conseil d'administration,

A. LANGLEIT
Secrétaire

C. VILVENS
Président

Novapex/Société : la publication généraliste de la SBM

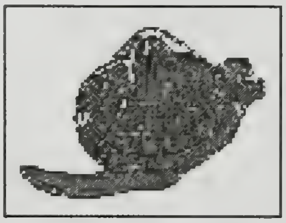
Rédacteurs en chef : Claude Vilvens & Etienne Meuleman

Tous les articles généraux sont les bienvenus pour Novapex/Société ☺ !

Afin de faciliter le travail de la Rédaction, il est vivement (et le mot est faible ;-)) souhaité de respecter les règles suivantes pour les articles proposés :

- document MS-Word (pour PC Windows 2000 ou XP);
- police de caractères Times New Roman;
- texte de taille 10, titres de taille 12;
- interligne simple;
- toutes les marges à 2,5 cm;
- document en une seule section;
- pas de mode colonne;
- photos en version électronique JPG.

Merci pour les Scribes ;-) ! N'hésitez pas à demander une page avec en-tête pour cadrer au mieux vos travaux (vilvens.claude@skynet.be ou e.meuleman@skynet.be).



Première signalisation de *Nassarius sesarmus* (Marrat, 1877) le long des côtes européennes de l'Atlantique Nord-Est (Algarve - sud du Portugal)

Christiane DELONGUEVILLE
Avenue Den Doorn, 5 – B - 1180 Bruxelles - christiane.delongueville@skynet.be

Roland SCAILLET
Avenue Franz Guillaume, 63 – B - 1140 Bruxelles - scaillet.roland@skynet.be

Carlos M. L. AFONSO
Centro de Ciências do Mar (CCMar), Faculdade de Ciências e Tecnologia, Universidade do Algarve, Campus de Gambelas, 8005-139, Faro, Portugal - cmlafonso@ualg.pt

MOTS-CLEFS Atlantique Nord-Est, Portugal, Algarve, Nassariidae, *Nassarius sesarmus*.

KEY-WORDS North-East Atlantic, Portugal, Algarve, Nassariidae, *Nassarius sesarmus*.

RÉSUMÉ

Nassarius sesarmus (Marrat, 1877), gastéropode originaire de l'Afrique de l'Ouest, a été récolté vivant pour la première fois le long des côtes de l'Algarve au sud du Portugal. Ceci représente une extension de sa distribution en Atlantique Nord-Est et la première signalisation dans les eaux européennes.

ABSTRACT

Nassarius sesarmus (Marrat, 1877), gastropod of West African origin, was found alive for the first time in the Algarve - South Portugal. This represents an extension of its distribution towards the North-East Atlantic and the first record in European waters.

INTRODUCTION

Le genre *Nassarius* Duméril, 1806 (Famille Nassariidae) compte de nombreux représentants le long des côtes atlantiques de l'Afrique de l'Ouest. Un certain nombre de confusions quant à la validité des espèces et à leurs déterminations a entouré ce genre dans cette partie du monde. Ce fait a amené Adam (1976) à revoir l'ensemble des espèces ouest-africaines. Il a notamment étudié tous les types et a proposé de nouvelles descriptions. Ainsi, le paralectotype et le lectotype (désigné) de *Nassarius sesarmus* (Marrat, 1877) ont été illustrés et le lectotype redécrit.

Il est intéressant de noter que lorsque William Adam a analysé les syntypes de *Nassarius heynemanni* (von Maltzan, 1884) l'un de ceux-ci s'est avéré être en fait un *N. sesarmus*. Ceci l'a amené à placer *N. heynemanni* partiellement (et le terme a son importance) en synonymie avec *N. sesarmus*, l'espèce *N. heynemanni* restant quant à elle bien distincte et valide.

D'autres synonymies ont été publiées, mais réfutées par Adam en 1976 et 1984.

Les caractéristiques principales de *N. sesarmus* selon Adam (1976) sont:

- les tours de la téléochonque présentent un étroit cordon subsutural limité en dessous par un sillon
- le premier tour présente 7 fines stries spirales accompagnées d'une striation verticale donnant au tour un aspect treillissé, la striation axiale disparaît graduellement vers la fin du premier tour
- A l'exception du cordon subsutural, les cordons spiraux s'effacent progressivement sur les autres tours, pour réapparaître derrière le péristome
- le dernier tour présente une trentaine de cordons spiraux devenant plus forts et plus espacés vers la base du tour
- le canal siphonal est droit, séparé de la coquille par une rainure et possède 7 cordons spiraux
- le péristome est doté de 13 à 15 plis (dents) équidistants
- le callus est épais et détaché dans sa partie basale avec un léger pli pariétal et un pli spiral à sa base
- le test est blanchâtre, irrégulièrement tacheté de brun et le bord columellaire est brunâtre à l'intérieur

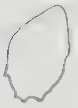
N. sesarmus est actuellement connu en Afrique de l'Ouest, notamment d'Angola (Rolán & Ryall, 1999) (Fig. 5 - 6), du Bénin (Dahomey), du Ghana, du Sénégal et du Sahara Occidental (Adam 1984).

RÉCOLTES

Une quinzaine de spécimens vivants munis de leur opercule ont été récoltés par le troisième auteur entre 2004 et 2010 (Fig. 1 - 2). Ils se trouvaient dans des pièges à poulpes placés par 40 à 60 m de profondeur sur un sol rocheux mêlé à du sable fin. Ces pièges se trouvaient immergés entre Lagos (Ponta da Piedade) et Burgau (Algarve - Portugal).

La taille des spécimens varie de 14,0 à 17,9 mm de haut (Fig. 3 - 4), ce qui est plus grand que les spécimens initialement rapportés par Adam (1984) qui ne dépassent pas 14,0 mm.

Tous les spécimens possèdent les caractéristiques décrites par Adam. En Algarve, la couleur de la téléochonque varie du jaune clair au brun. Quelques taches (flammules) de couleur sont visibles sur le dernier tour de certains exemplaires.



L'opercule est de forme ovale, légèrement translucide et de couleur jaune-brun.

Fig.7

Il est à noter qu'en 2000 déjà, 3 spécimens occupés par des pagures avaient été trouvés par le troisième auteur dans des casiers à crabes déposés au large d'Armação de Pêra.

CONCLUSIONS

Déjà connue en Afrique de l'Ouest, cette espèce est à présent répertoriée dans les eaux de l'Algarve au sud du Portugal. Ceci représente une extension de sa distribution et *N. sesarmus* fait donc partie de la faune atlantique européenne.

RÉFÉRENCES

Adam, W. (1976). Quelques espèces ouest-africaines de *Nassarius* (s.l.) décrites par F.P. Marrat (1877, 1878) et par H. von Maltzan (1884) (Mollusca Prosobranchia). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique – Biologie,* 51(2) :1-29 + 3 planches.

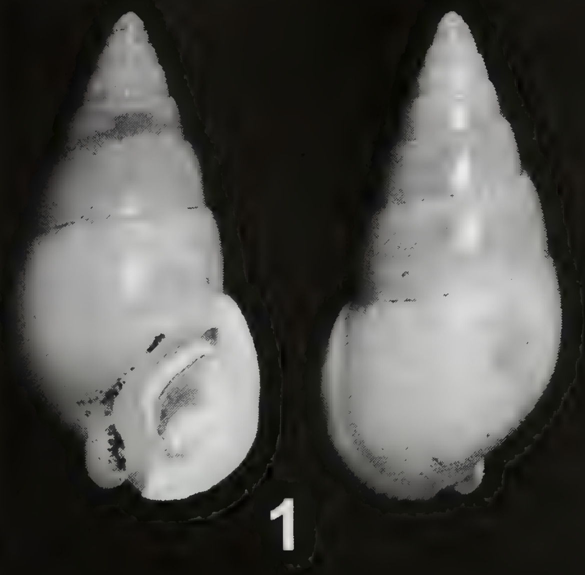
Adam, W. & Knudsen, J. (1984). Révision des Nassariidae (Mollusca : Gastropoda Prosobranchia) de l'Afrique Occidentale. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique – Biologie,* 55(9) : 1-95 + 5 planches.

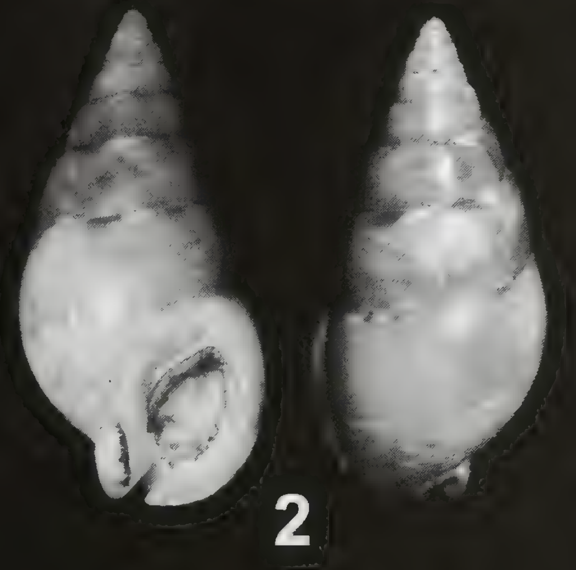
Rolán, E. & Ryall, P. (1999). Checklist of the Angolan Marine Molluscs. *Reseñas Malacológicas,* X. Sociedad Española de Malacología, Madrid, Spain. 132p.

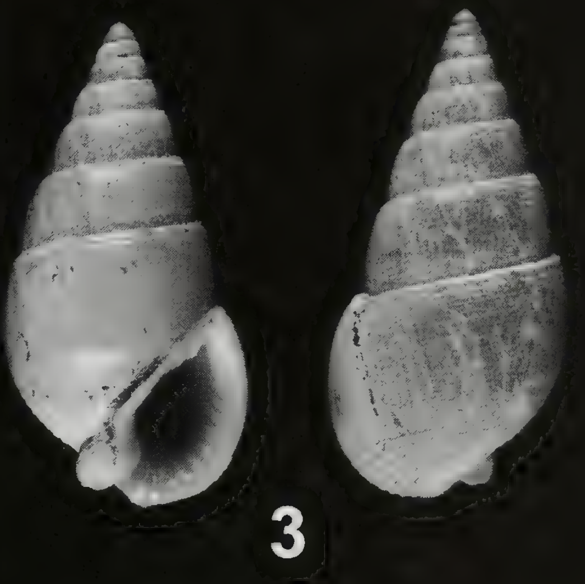
LÉGENDES

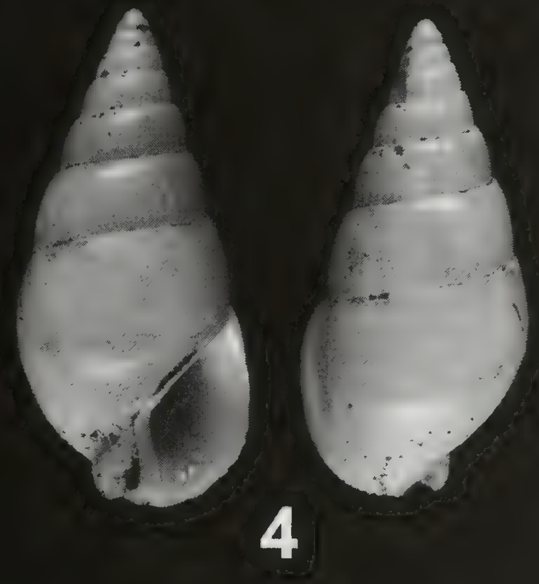
Nassarius sesarmus (Marrat, 1877)

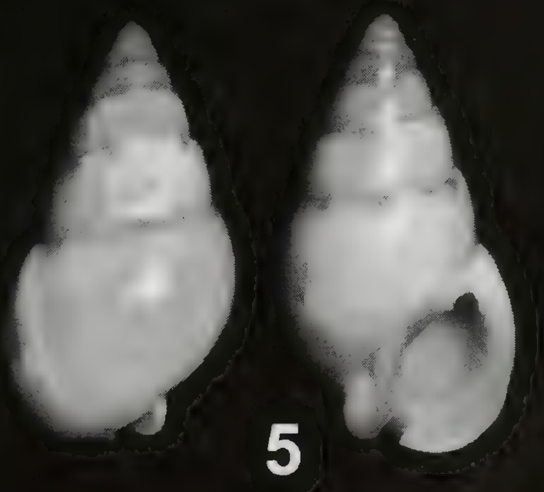
Fig. 1	Ponta da Piedade - Algarve - Portugal	17,77 x 8,08 mm
Fig. 2	Burgau - Algarve - Portugal	17,14 x 7,80 mm
Fig. 3	Burgau - Algarve - Portugal	17,88 x 8,24 mm
Fig. 4	Burgau - Algarve - Portugal	15,76 x 7,76 mm
Fig. 5	Luanda - Angola	12,87 mm
Fig. 6	Luanda - Angola	13,86 mm
Fig. 7	Burgau - Opercule du spécimen de la figure 2	3,70 x 2,30 mm

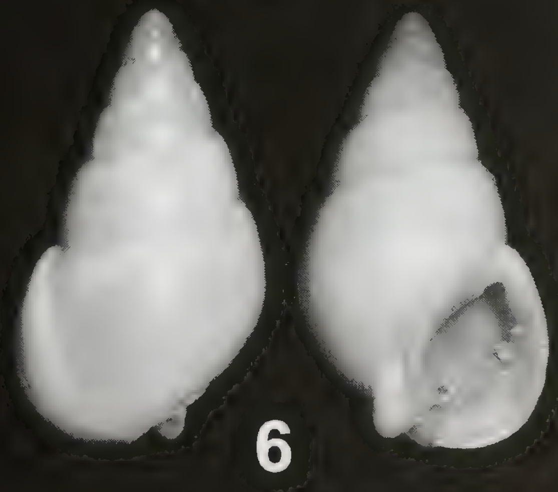

1

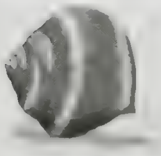

2


3


4


5

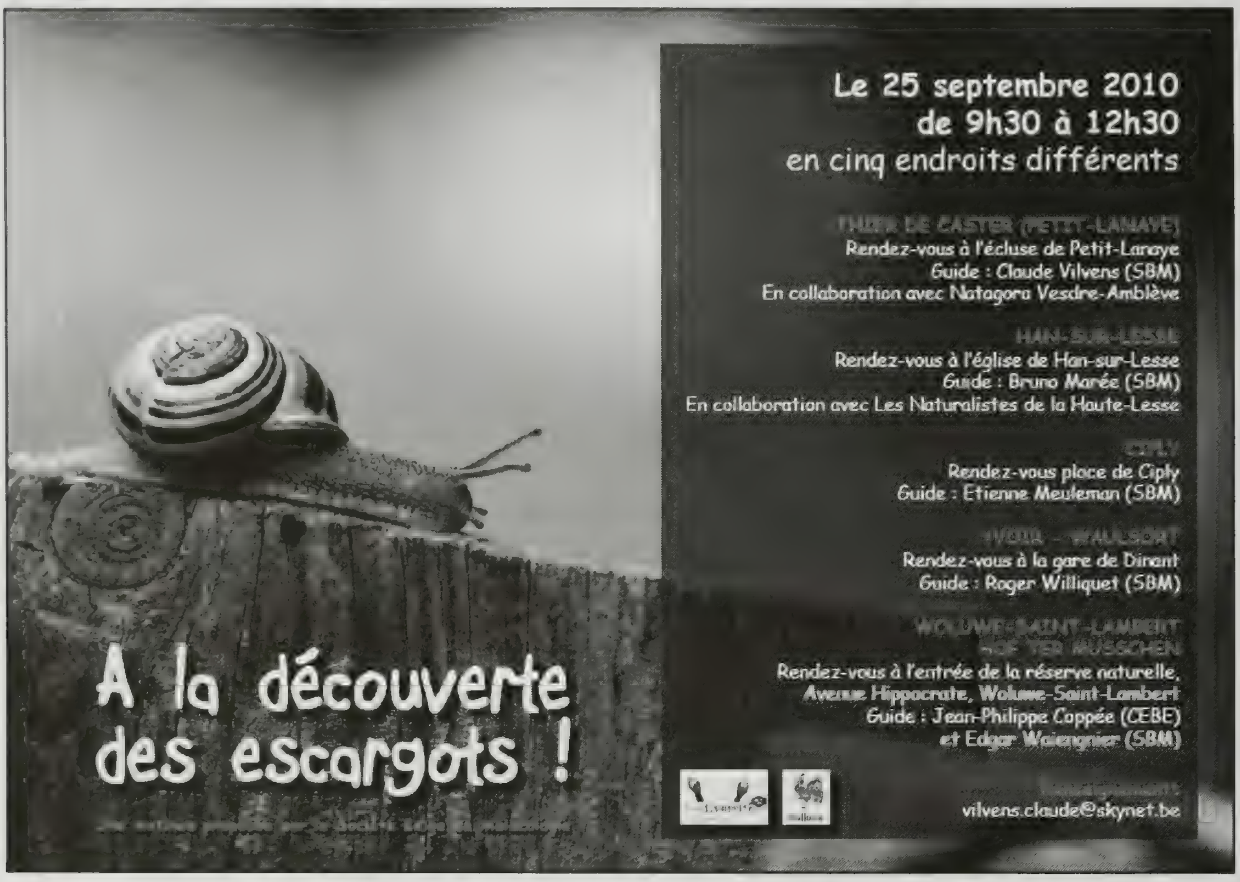

6



Les balades "A la découverte des escargots" (25 septembre 2010)

Claude VILVENS avec
Etienne MEULEMAN, Roger WILLIQUET, Bruno MAREE, Jean-Philippe COPPEE
(Photographies : Claude VILVENS & Roland HOUART)

Voilà bien des excursions sortant de l'ordinaire que celles programmées ce 25 septembre ! Oui, oui, celles car la SBM, en collaboration avec le Département de la Nature et des Forêts (DNF) de la Région Wallonne, avait programmé 5 excursions simultanées : 4 en différents points de Wallonie et la 5$^{\text{ème}}$ dans la région de Bruxelles. Objectif : permettre au grand public intéressé par la Nature de découvrir le monde des escargots et des limaces avec des guides de la SBM. Voici l'affiche qui annonçait la journée :



Le 25 septembre 2010
de 9h30 à 12h30
en cinq endroits différents

THIER DE CASTER (PETIT-LANAYE)
Rendez-vous à l'écluse de Petit-Lanaye
Guide : Claude Vilvens (SBM)
En collaboration avec Natagora Vesdre-Amblève

HAN-SUR-LESSE
Rendez-vous à l'église de Han-sur-Lesse
Guide : Bruno Marée (SBM)
En collaboration avec Les Naturalistes de la Haute-Lesse

CIPLY
Rendez-vous place de Ciply
Guide : Etienne Meuleman (SBM)

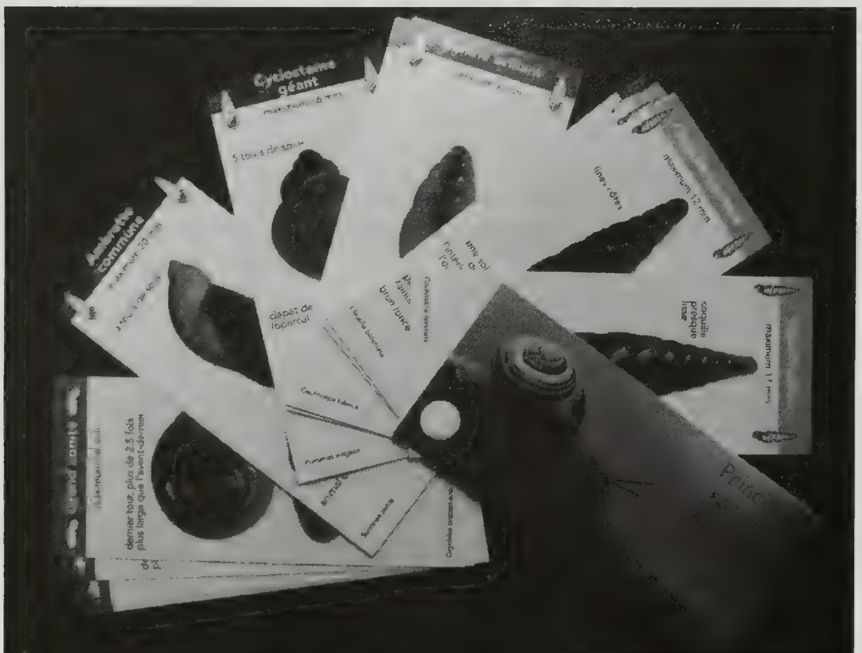
YVOIR – WAULSORT
Rendez-vous à la gare de Dinant
Guide : Roger Williquet (SBM)

WOLUWE-SAINT-LAMBERT
HOF TER MUSSCHEN
Rendez-vous à l'entrée de la réserve naturelle,
Avenue Hippocrate, Woluwe-Saint-Lambert
Guide : Jean-Philippe Coppée (CEBE)
et Edgar Waiengnier (SBM)

vilvens.claude@skynet.be

A la découverte
des escargots !

Pour permettre aux participants de conserver une trace de cette première initiation, Claude Vilvens et Etienne Meuleman ont conçu en collaboration étroite Michel Baillij et le photographe Olivier Charlier (tous deux du Département de la Nature et des Forêts – DNF - de la Région Wallonne) un "éventail escargots":

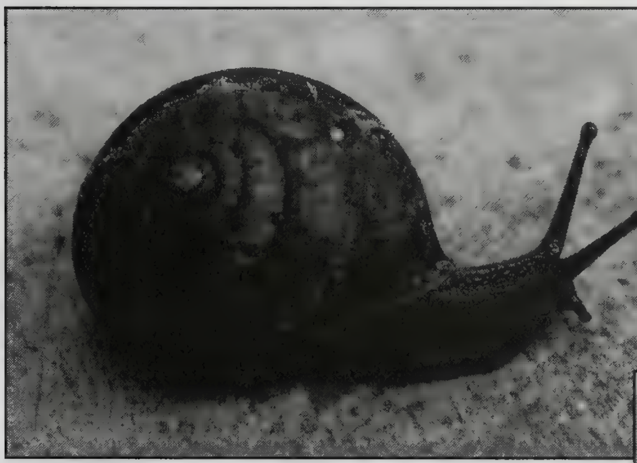


L'idée était de proposer au grand public une clé simplifiée des escargots et limaces les plus courants en Wallonie, clé que même les enfants pourraient utiliser avec un peu d'entraînement. Le résultat de notre travail a été unanimement apprécié par les participants … qui n'on malheureusement pas été très nombreux ☹ Sans doute les jours de lourdes pluies qui ont précédé le jour de la ballade, une publicité un peu tardive et trop restreinte, une aide très limitée des medias comme la radio, le côté assez pointu du sujet lui-même, bref tout cela n'a pas attiré les foules. Ainsi, les guides de Schaerbeek-Bruxelles n'ont vu arriver personne …

Vous trouverez ci-dessous les comptes-rendus des autres guides : en général, si peu de monde, par contre beaucoup d'espèces observées ☺ Le tableau récapitulatif ci-dessous vous en donnera une idée ! Mais laissons parler les joyeux G.O. ….

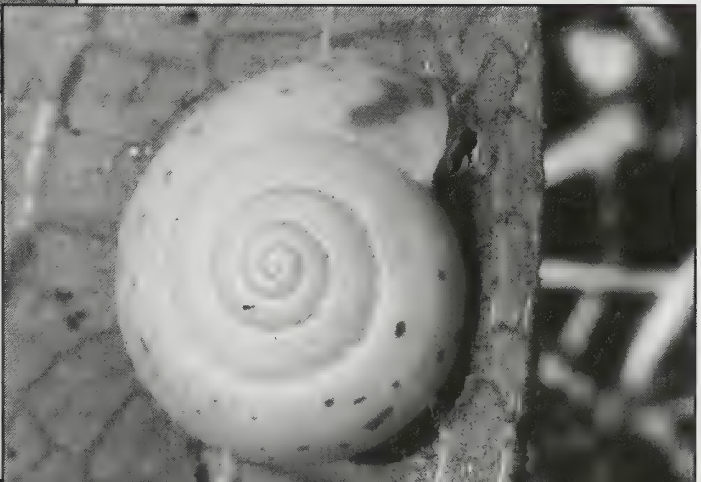
1) Petit-Lanaye (Thier de Caster) – Claude Vilvens (photos: Claude Vilvens)

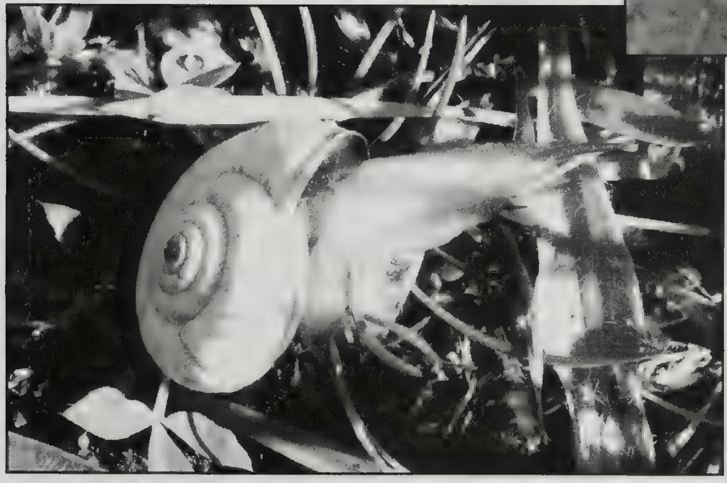
On peut dire que les 7 participants ont eu beaucoup de chance : après des jours de pluies soutenues, ca samedi matin fut ensoleillé et très doux. Autrement dit, le temps idéal pour observer les escargots et les limaces. Et, de fait, nous n'avons pas été déçus : le tableau ci-dessous est évocateur. Ainsi, nous avons observé tous les Clausiliidae de la clé simplifiée ;-) Les participants qui découvraient le monde des mollusques ont été très satisfaits. L'un des participants (Johan Delcourt) a placé nos observations sur observations.be. Un autre (Jean-Marc Michalowski), un spécialiste de la photo, a placé ses plus beaux clichés de la journée sur naturaliste.be. Donc, en conclusion : expérience très positive ! A refaire avec beaucoup plus de publicité !



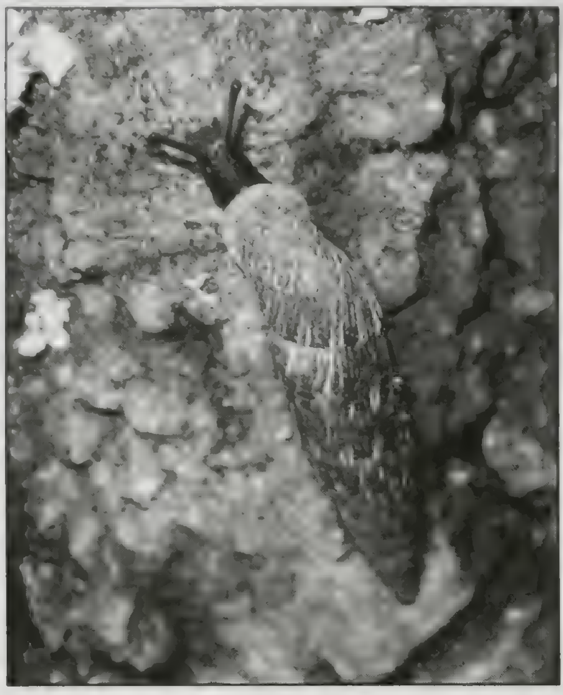
Monachoides incarnatus (Müller, 1774)

Fruticicola fruticum (Müller, 1774)



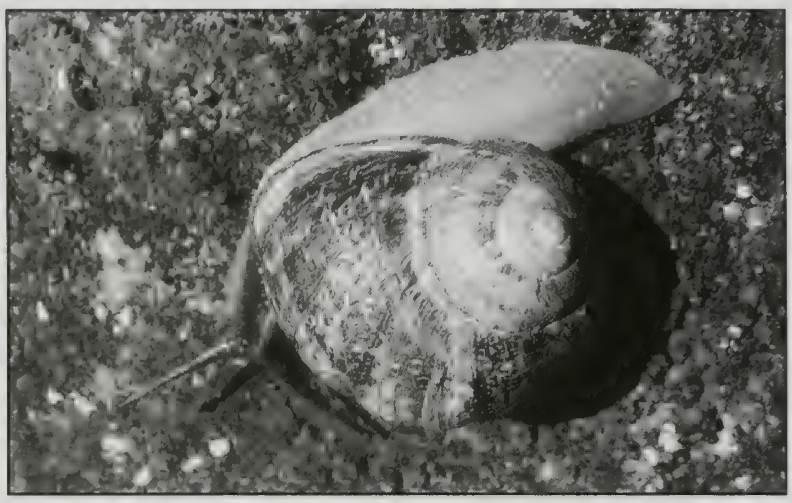


Cernuella neglecta (Draparnaud, 1805)

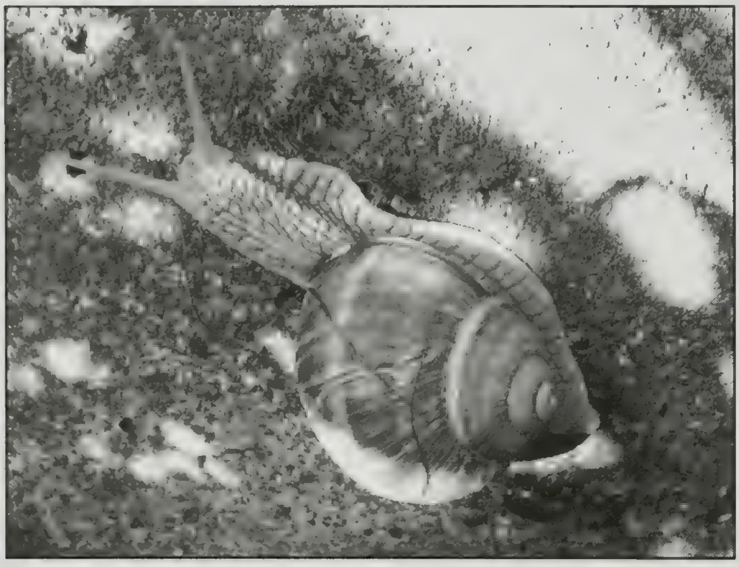


Balea biplicata (Montagu, 1803)

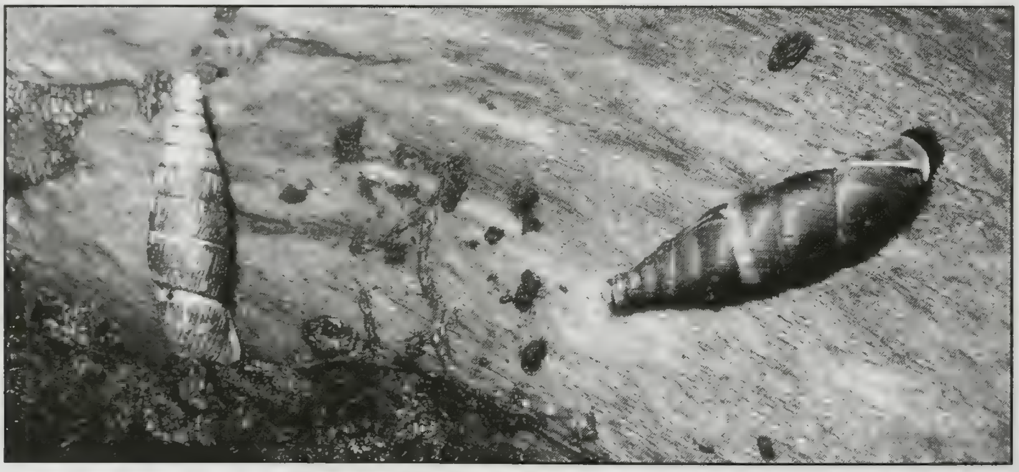
Cornu aspersum (Müller, 1774)



Helix pomatia Linnaeus, 1758



Macrogastra rolphii (Turton, 1826)



Trichia hispida (Linnaeus, 1758)

Merdigera obscura (Müller, 1774)

2) Han-sur-Lesse – Bruno Marée

Dans le cadre de l'Année Internationale de la Biodiversité, cette activité était organisée à l'initiative du Service Public de Wallonie, en collaboration avec la Société Belge de Malacologie. Cinq activités similaires et simultanées étaient proposées par la SBM en Région Wallonne et à Bruxelles et de gros moyens avaient été mis en oeuvre pour en assurer la promotion et la réussite : informations diffusées en radio, publication d'affiches en quadrichromie, distribution gratuite d'éventails de détermination des principaux gastéropodes de nos régions...

Hélas, trois fois hélas, succès final très mitigé : à Han, 7 participants (dont le guide + 2 naturalistes de la Haute-Lesse, 2 amis et 2 parents !) et, à ma connaissance, pas davantage aux autres points de rendez-vous avec, même, quelques guides qui sont restés seuls à attendre le client.

À Han-sur-Lesse, très agréable promenade entre amis dans la « Chavée » de la Lesse, temps radieux malgré les pluies abondantes des jours précédents et une bonne vingtaine d'espèces différentes d'escargots et de limaces à découvrir, à cueillir et à observer de près... avant de les relâcher. A signaler aussi : *Radix balthica* dans les eaux du Ri de la Planche.

C'était chouette, mais la mise en œuvre de gros moyens pour un si faible résultat auprès du « grand public » invite à revoir impérativement la formule...

3) Leffe - Dinant – Roger Wiliquet (photos: Roland Houart)

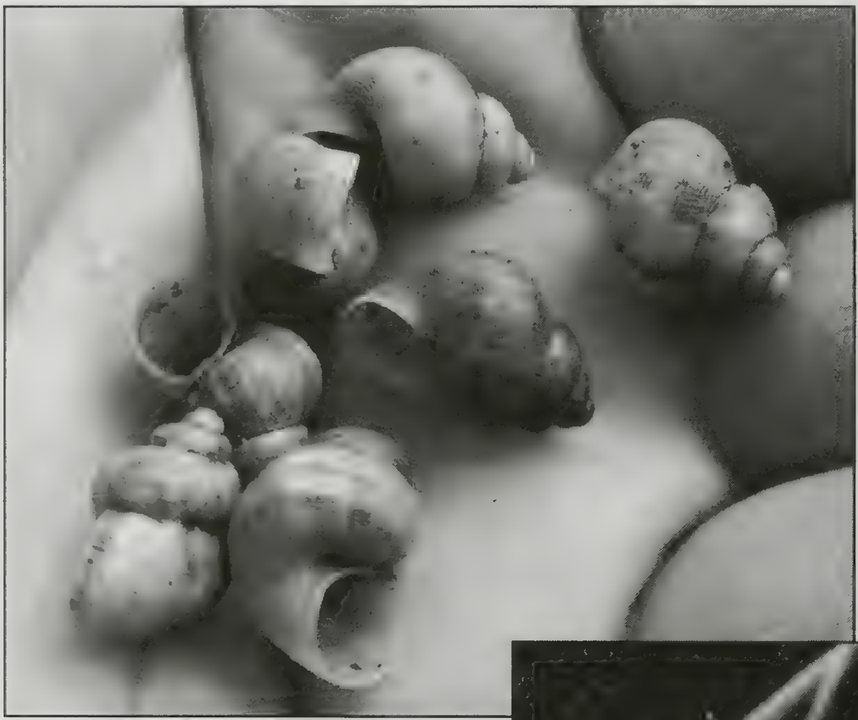
Nous étions dix participants (dont six non-initiés d'une même famille) à profiter de cette magnifique matinée. Le temps était propice à la découverte des mollusques. Les cieux étaient avec nous. C'est ainsi que nous avons commencé notre promenade au pied de l'abbaye de Leffe en empruntant un petit sentier qui rejoint la route menant à Spontin – Huy. D'un côté, un vieux mur de pierres calcaire en partie recouvert par de la mousse (idéal pour les petites espèces) et de l'autre, un versant rocheux couvert de végétation diverse mais, principalement de ronces (idéal pour les espèces plus grosses).

Les explications ne furent pas longues à donner avant que chacun ne se prenne au jeu de : qui dénichera son escargot . Les éventails (distribués gratuitement) sur lesquels figurent les principaux gastéropodes de nos contrées eurent un franc succès et ont permis de mettre un nom sur la plupart des espèces découvertes.

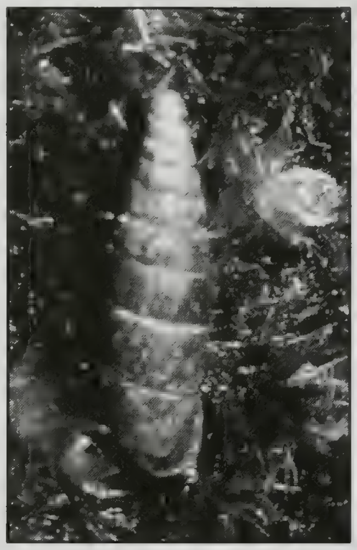
C'est en ne voyant pas passer le temps que nous avons terminé nos recherches le long de la Leffe. La aussi, les spécimens observés étaient assez nombreux. Notre ami et photographe attitré de ce jour, Roland Houart a fait de très belles photos du site prospecté et des animaux in-situ.

L'équipe de Leffe

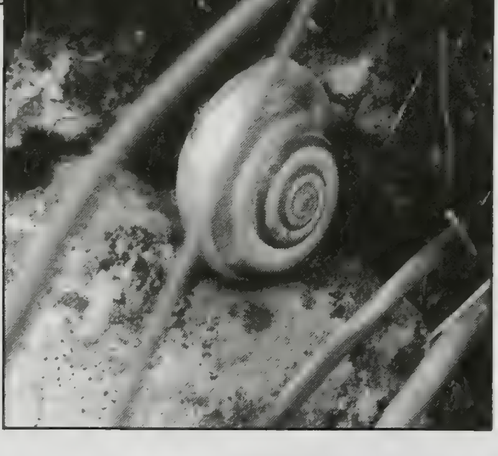
Qu'en pensez-vous ? Savoir que les lieux sont beaux et facilement accessibles, qu'on ne se déplace que sur deux ou trois cent mètres, que les mollusques sont présents et en nombre (la liste ci-dessous le prouve), ça ne vous met pas l'eau à la bouche ? Ce fut une matinée très agréable, pleinement satisfaisante, je suis prêt à recommencer et à vous guider sur le même parcours durant une journée. Il y a encore d'autres espèces à découvrir.



Pomatias elegans (Müller, 1774)

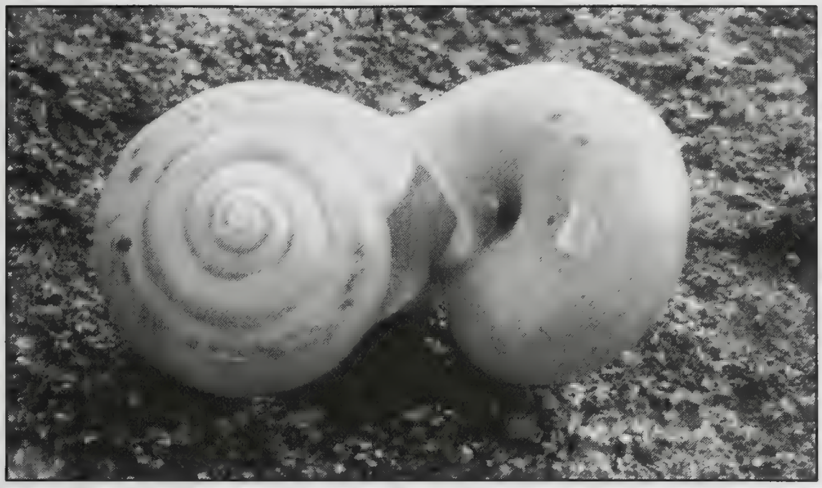


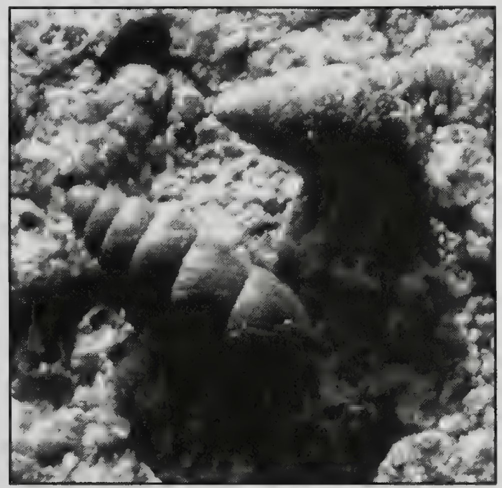
Clausilia parvula (Férussac, 1807)



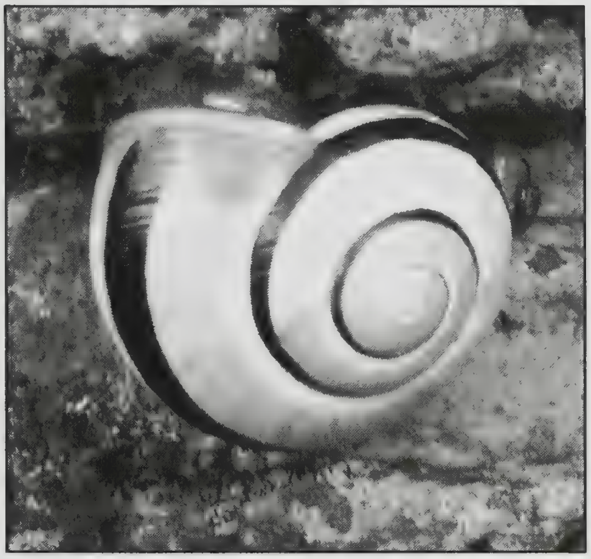
Helicella itala (Linnaeus, 1758)

Fruticicola fruticum (Müller, 1774)

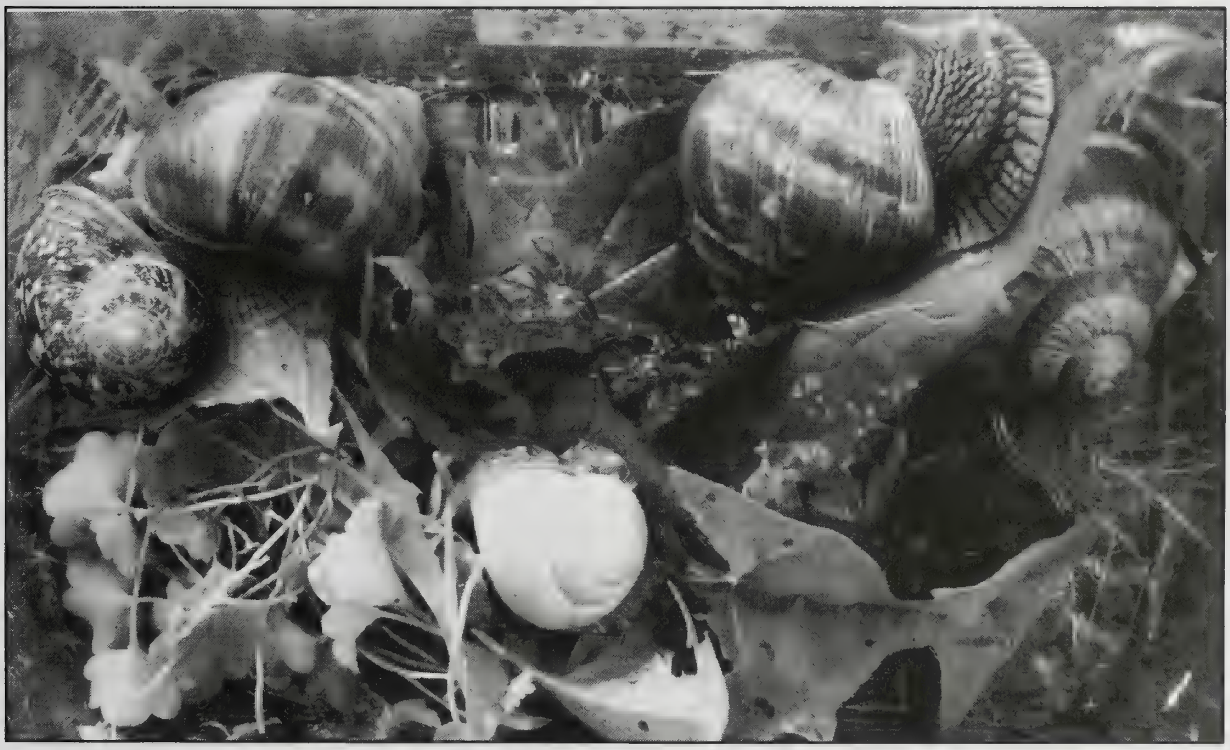




Chondrina avenacea (Bruguière, 1783)



Cepaea nemoralis (Linnaeus, 1758)



Helix pomatia Linnaeus, 1758, ***Cornu aspersum*** (Müller, 1774) et ***Cepaea nemoralis*** (Linnaeus, 1758)

Arion rufus (Linné, 1758)

Pyramidula rupestris (Draparnaud, 1801)

4) Ciply (Les Rogneaux) – Etienne Meuleman

Les participants n'étaient pas très nombreux pour la balade à Ciply ce 25 septembre, pas nombreux, mais très motivés ! Ce sont deux familles avec de jeunes enfants qui étaient présentes pour découvrir le monde merveilleux des escargots. Après une brève introduction sur le monde des mollusques, les participants se sont mis en chasse pour récolter des coquilles. Un peu déçus au départ, ils ont très vite changé d'avis lorsque je leur ai montré où chercher et ce qu'ils pouvaient trouver. A part, l'escargot de bourgogne et les cepaea qu'ils avaient déjà vu dans leur jardin, ils ne s'imaginaient pas qu'il pouvait exister d'autres espèces plus petites et non moins intéressantes au bord du chemin. Il faut dire aussi que les conditions météorologiques étaient idéales pour la récolte : un doux soleil d'automne après une semaine pluvieuse. En fin de compte, les parents ravis ont demandé de renouveler l'expérience en faisant cette fois une meilleure publicité au niveau local.

5) Woluwe-Saint-Lambert (Bruxelles-Capitale) - Jean-Philippe Coppée

Samedi 25 septembre 2010, après plusieurs jours pluvieux et assez froids, le soleil de septembre inonde la capitale du pays. Après un bref crochet par Schaerbeek, Edgar (Waiengnier) et moi arrivons sur le site de l'Hof ter Musschen à Woluwe-Saint-Lambert. Ce site, géré par la Commission de l'Environnement de Bruxelles et Environs (CEBE asbl), est situé en contrebas des cliniques universitaires Saint-Luc (UCL). Classé au patrimoine naturel bruxellois, cet ensemble de prairies et de marais est un site naturel Natura 2000 abritant 49 espèces de mollusques. Voilà donc le lieu idéal pour partir à la découverte des escargots.

Bizarre, il n'est que 9 heures et quart, et personne ne fait le pied de grue en cherchant après le guide. D'habitude lorsque nous arrivons pour une visite, des amateurs nous attendent déjà. A 9h30, équipés de pied en cap, nous attendons toujours le chaland. Le quart d'heure académique se passe, sans qu'âme qui vive daigne se montrer. Nous décidons donc de retourner quelques morceaux de bois pour passer le temps. Juste ce qu'il faut pour découvrir une coquille de *Discus rotundatus*, un petit exemplaire de *Deroceras sp.*, deux belles *Limax maximus* et un *Arion* du complexe *A. hortensis-distinctus-owenii.*

Bien entendu, nous gardons toujours un œil sur le point de rendez-vous situé à quelques mètres. Dix heures dix, nous devons nous rendre à l'évidence. Personne ne viendra. Est-ce dû aux prévisions météo pessimistes ? Ou au manque de publicité ciblée ? A la position décalée du site par rapport aux autres ? Difficile de le savoir ! Et dire que nous disposions d'un splendide petit outil pédagogique avec cet éventail illustrant un grand nombre d'espèces.

Edgar et moi avons fait le tour du site (tant qu'à être dehors, autant en profiter) et avons ensuite repris la voiture pour rentrer chez nous. Dommage qu'une telle débauche d'énergie ne soit pas mieux récompensée. Mais, ce n'est que partie remise, ce sera mieux la prochaine fois.

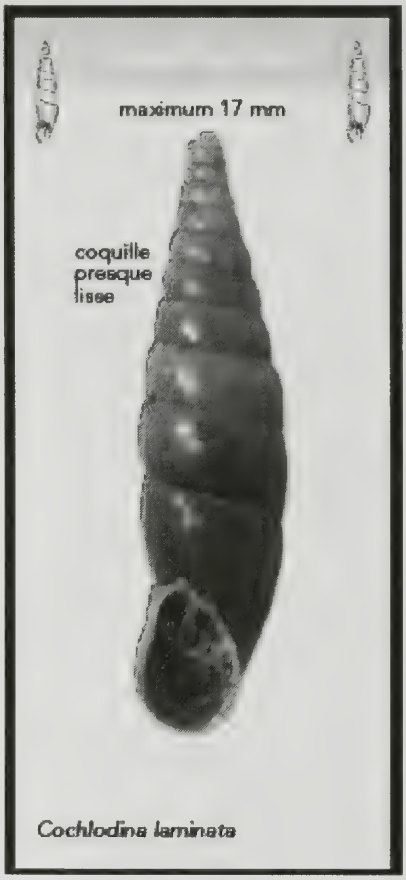
*****

Liste des espèces observées dans les 4 sites de la ballade escargots en Wallonie (lv = living, dd = dead only).

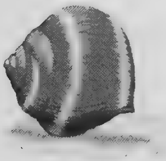
Espèces et familles	Petit-Lanaye	Leffe	Ciply	Han / Lesse
Pomatiidae				
Pomatias elegans (Müller, 1774)	lv	lv		lv
Succineidae				
Succinea putris (Linnaeus, 1758)	lv			lv
Succinella oblonga (Draparnaud, 1801)			lv	
Oxyloma elegans (Risso, 1826)				lv
Cochlicopidae				
Cochlicopa lubrica (Müller, 1774)			lv	lv
Valloniidae				
Vallonia costata (Müller, 1774)	lv	lv		
Pupillidae				
Pupilla muscorum (Linnaeus, 1758)		lv	lv	
Pyramidulidae				
Pyramidula rupestris (Draparnaud, 1801)		lv		
Chondrinidae				
Chondrina avenacea (Bruguière, 1783)		lv		
Enidae				
Merdigera obscura (Müller, 1774)	lv	lv	dd	lv
Clausiliidae				
Cochlodina laminata (Montagu, 1803)	lv			lv
Macrogastra rolphii (Turton, 1826)	lv		lv	lv
Clausilia rugosa parvula (Férussac, 1807)	lv	lv		lv
Clausilia bidentata (Ström, 1765)	lv	lv		lv
Balea biplicata (Montagu, 1803)	lv	lv		
Patulidae				
Discus rotundatus (Müller, 1774)			lv	lv
Oxychilidae				
Oxychilus cellarius (Müller, 1774)	lv		dd	lv
Oxychilus draparnaudi (Beck, 1837)	lv	lv		
Oxychilus helveticus (Blum, 1881)	lv			
Aegopinella nitidula (Draparnaud, 1805)	lv			lv
Milacidae				
Tandonia rustica (Millet, 1843)	lv			lv
Limacidae				
Limax maximus Linné, 1758	lv			
Agriolimacidae				
Deroceras panormitanum (Lessona & Pollonera, 1882)	lv			
Deroceras reticulatum (Müller, 1774)				lv
Arionidae				
Arion rufus (Linné, 1758)	lv	lv	lv	lv
Arion silvaticus Lohmander, 1937	lv			
Arion hortensis Férussac, 1819	lv	lv	lv	lv

Vitrinidae				
Vitrina pellucida (Müller, 1774)		lv		
Bradybaenidae				
Fruticicola fruticum (Müller, 1774)	lv	lv		lv
Helicodontidae				
Helicodonta obvoluta (Müller, 1774)	dd	lv		lv
Hygromiidae				
Trichia hispida (Linnaeus, 1758)	lv	lv		lv
Helicella itala (Linnaeus, 1758)	lv	lv		
Cernuella neglecta (Draparnaud, 1805)	lv			
Monachoides incarnatus (Müller, 1774)	lv		dd	lv
Helicidae				
Helicigona lapicida (Linnaeus, 1758)				lv
Cepaea nemoralis (Linnaeus, 1758)	lv	lv	lv	lv
Cepaea hortensis (Müller, 1774)	lv			lv
Cornu aspersum (Müller, 1774)	lv	lv		lv
Helix pomatia Linnaeus, 1758	lv	lv	lv	lv

Escargot des bois
maximum 25 mm
lèvre d'ouverture brune
ligne de plus grande ouverture parallèle à l'axe de la coquille
jaune, rose ou brun
nombre de bandes très variable (de 0 à 5)
Cepaea nemoralis


maximum 17 mm
coquille presque lisse
Cochlodina laminata

Rendez-vous à l'année prochaine
pour de nouvelles balades escargots ☺ !



Etymologie et malacologie dans deux sites naturels du nord-est de Bruxelles

– Troisième partie : les limaces

Jean-Philippe COPPEE
Rue Jean-Baptiste Mosselmans, 44 – B - 1140 Bruxelles – jp.coppee@yucom.be
(CEBE ASBL – www.cebe.be)

Introduction

Après avoir approché les bivalves et les escargots d'eau douce dans les numéros précédents, faisons une pause dans toutes ces coquilles et observons d'un peu plus près le groupe de gastéropodes qui en sont dépourvus, à savoir les limaces.

Si les escargots n'attirent pas toujours le regard, ils ont néanmoins bien meilleure réputation que les limaces. De prime abord, celles-ci n'ont rien pour elles. Elles sont visqueuses et, surtout, surtout, elles dévorent nos plantations et cultures.

Pourtant, à qui se donne la peine de les observer, les limaces offrent un tableau surprenant de couleurs variables et parfois très tranchées.

Continuons notre voyage au travers des mots pour découvrir les 3 familles et les 6 espèces qui composent la faune actuellement connue des limaces de ces deux sites bruxellois que sont le Moeraske-Walckiers et l'Hof ter Musschen.

Le terme « limace » vient du latin « limax, limacis », dérivé lui-même du mot grec « leimon » signifiant « lieu humide, prairie ». C'est cette racine grecque qui a également donné le terme « limoneux » en français. Nous voici donc avec une allusion, on ne peut plus claire, à l'habitat de ces mollusques qui recherchent l'humidité et le contact avec le sol.

En néerlandais, les limaces sont dénommées « naaktslakken », littéralement « escargots nus », par opposition aux « huisjesslakken », les escargots « avec maison » (huisje : petite maison).

Afin de systématiser notre revue des espèces présentées, nous avons abordé ces animaux famille par famille, en appliquant la succession proposée dans la « Checklist of species-group taxa of continental Mollusca living in Belgium (Clecom Section I) ».

Famille des Limacidae

Le nom de cette famille vient du latin « limax, limacis » qui signifie limace.

Limax maximus Linnaeus 1758

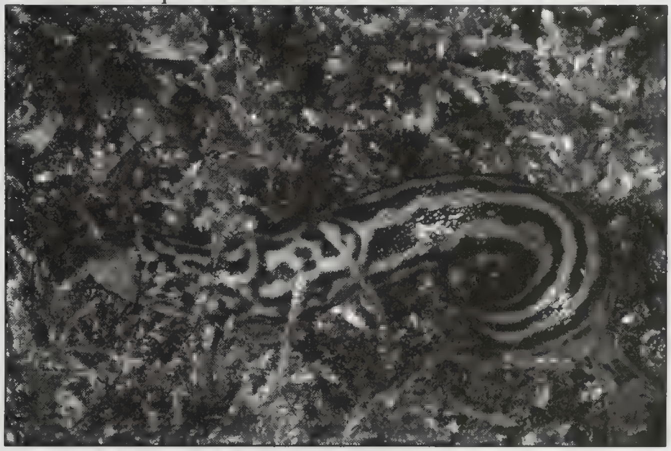
Le genre *Limax* vient bien évidemment de la même racine latine que le nom de la famille.

Le nom d'espèce *maximus* est sans équivoque : c'est le superlatif de « magnus » (grand). Il s'agit donc, littéralement, de la plus grande limace (10 à 20 cm).

Cette référence à sa grande taille se retrouve en français (Grande limace cendrée) ou en anglais (Giant Garden Slug).

Certaines formes de cette espèce présentent une livrée tachetée. Ces formes lui ont valu également les noms évocateurs de « tijgerslak » (limace tigrée) en néerlandais, « Leopard Slug » (limace léopard) en anglais, « Tigerschnegel » (à nouveau limace tigrée) en allemand et « Babosa atigrada » (limace tigrée) en espagnol. En français, on retrouve parfois également cette appellation de « limace tigrée ».

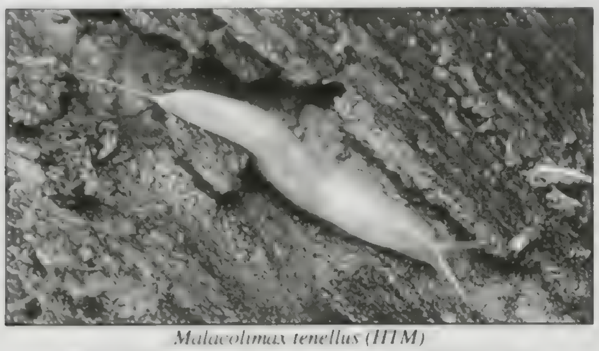
Cette belle et grande limace est observable tant à l'Hof ter Musschen que sur le site du Moeraske-Walckiers.



Limax maximus (Moeraske)
Jacques Roses - Copyright © 2010 CEBE-MOB

Malacolimax tenellus (O.F. Müller, 1774)

Le nom de genre *Malacolimax* vient de la



Malacolimax tenellus (HTM)
Sophie Valtat (SBM) - Copyright © 2010 CEBE-MOB

juxtaposition du terme « malaco » et du genre *Limax*. La racine « malaco » vient du grec « malakos » (doux, tendre, mou) qui est à l'origine des termes « malacologie » et « malacologue » en français. Le genre *Limax*, ancien nom de genre de cette espèce, y a été associé afin de former ce nouveau nom de genre. Le nom d'espèce *tenellus* signifie « délicat, mince, gracile » et fait référence au corps de cet animal qui a une apparence fine et gélatineuse.
L'animal (3 à 4 cm) est jaune clair. Même le mucus produit a la même couleur. Cette teinte se retrouve dans le nom français de cette limace qui est appelée « limace jaune des bois » ou « limace gélatineuse ».

Cette espèce se nourrit de champignons, particularité qui se retrouve dans le nom allemand : « Pilzschnegel » (« pilz » signifiant « champignon »).
Les dénominations néerlandaise « tere aardslak » (teer : délicat) et anglaises « slender slug » (slender : grêle) ou « tender slug » (tender : tendre) rappellent le nom d'espèce *tenellus*.
Affectionnant les bois et forêts, cette espèce est observable au niveau du bois de l'Hof ter Musschen.

Famille des Agriolimacidae

Le nom de cette famille est composé de « agrio » issu du latin « ager » qui signifie « champ » et de « limax », déjà cité.

Deroceras reticulatum (O.F. Müller, 1774)

Deroceras reticulatum (Hof ter Musschen)
David Waiengnier - Copyright © 2010 CEBE-MOB

Deroceras reticulatum est une limace de taille moyenne (3,5 à 5 cm), qui peut occasionner de gros dégâts aux cultures. Extrêmement courant, ce mollusque est présent sur les deux sites bruxellois.
Le genre *Deroceras* est formé de la racine grecque « dera » qui signifie « cou » et de « ceras », oreille. Il faut imaginer que ce sont les tentacules qui sont à l'origine du nom de genre.
Le nom d'espèce *reticulatum* trouve son inspiration dans le terme latin « reticulum » (filet à maille croisée) et fait référence au dessin en réseau, plus ou moins marqué de foncé, qui parcourt le corps de l'animal.
Cette limace est dénommée « limace réticulée » en français, ce qui est une traduction littérale du nom scientifique. On peut retrouver également le nom de « petite limace grise », qualificatif de couleur que l'on retrouve également dans le nom anglais « Grey field slug ». Il existe une autre dénomination anglaise : « netted slug ». Dans celle-ci, il est à nouveau fait référence au dessin présent sur le corps de cette limace (net : réseau, filet).
En néerlandais, *Deroceras reticulatum* reçoit le nom de « Gevlekte akkerslak » ce qui signifie la limace (des champs) tachetée. On y remarque à la fois la référence au dessin en réseau et aux cultures, milieu que cet animal affectionne.
En allemand, cet animal s'appelle communément « Genetzte Ackerschnecke ». Comme en néerlandais, on y rappelle un des habitats de cette limace, à savoir les cultures (Acker : champ)

Famille des Arionidae

Le nom de cette famille est composé à partir du nom de genre *Arion*. Il fait peut-être référence à un poète et musicien grec originaire de Lesbos : Arion de Méthymne. Ce dernier vécut au $7^{\text{ème}}$ siècle avant J.-C. L'écrivain Hérodote raconte qu'Arion, voyageant sur un navire, fut contraint par l'équipage de se jeter à la mer. Avant de se précipiter dans les flots, il chanta. Une fois dans l'eau, il fut sauvé par un dauphin.
Hérodote affirme également que ce poète fut l'inventeur de la poésie dithyrambique.
Toujours dans la littérature antique, dans l'Iliade d'Homère, Arion est un cheval à la crinière verte et doué de parole.

Le genre fut décrit en 1819 par Ferussac qui choisit de le baptiser *Arion*. Le lien entre la limace et le poète grec (ou le cheval d'Homère) n'est vraiment pas apparent.

Une explication plausible est néanmoins donnée par Lodewijk van Duuren (www.anemoon.org), qui cite E. Degner d'Hambourg. Selon lui, Ferussac aurait pu, lors de sa description, faire référence à l'écrivain antique Aelian qui relate l'histoire d'escargots qui, menacés par des oiseaux, quittent leur coquille pour y retourner une fois le danger passé. Ces escargots auraient donc, le temps de leur fuite, pris l'aspect de limaces !
Quoiqu'il en soit, il semblerait donc que l'origine du nom de genre soit probablement à retrouver dans la littérature antique.

En néerlandais, ce genre est dénommé « *wegslak* » et en allemand « *Wegsnecke* », littéralement « limace des chemins ». En effet, après une averse, il n'est pas rare d'observer de nombreux individus appartenant à ce genre sur nos chemins et routes.
Les sites de l'Hof ter Musschen et du Moeraske-Walckiers abritent 3 espèces appartenant à cette famille.

Arion hortensis (Ferussac, 1819)
Le nom d'espèce *hortensis* vient du latin « hortus » (jardin) et du suffixe « ensis » (habitant de, appartenant à ou habitat de), soit, littéralement, « habitant les jardins ».

Cette petite limace de 3 à 4 cm est fréquente sur nos deux sites. De couleur foncée, presque noire, elle présente une sole, le dessous du pied, de couleur orangée.
Nous devons la description de cette espèce au Baron André Étienne Justin Pascal Joseph François d'Audebert de Ferussac (1786-1836).
Parmi les travaux de ce naturaliste malacologue, notons un « Tableau systématique des animaux mollusques » (1822) et une « Histoire naturelle générale et particulière des mollusques terrestres et fluviatiles » en 4 volumes (1820-1851), ouvrage entamé par son père et qu'il mena à terme.

Le nom vernaculaire français est facile à deviner : « limace des jardins » ou encore « limace horticole ».

Arion sp. (groupe Arion hortensis) (Evere - jardin)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

En néerlandais, cette limace porte le nom de « zwarte wegslak » (limace noire). En allemand (Garten-Wegschnecke), on retrouve une traduction du nom d'espèce, comme en français.
En Suisse alémanique, on précise même qu'il s'agit de la « vraie limace des jardins » (Echte Garten-Wegschnecke).
Enfin, en langue anglaise, cet animal est dénommé soit « Garden arion » (arion des jardins), soit « small stripped slug » (petite limace dépouillée ou déshabillée).

Arion distinctus (Mabille, 1868)
Cette espèce a été uniquement observée sur le site du Moeraske-Walckiers.
Arion distinctus ressemble très fort à *A. hortensis*. La distinction entre les deux espèces est particulièrement difficile à faire. En fait le complexe « *Arion hortensis* » a été scindé en 3 espèces (*A. hortensis*, *A. distinctus* et *A. owenii*) différant entre elles par des critères anatomiques. Le recours à la dissection est donc inévitable pour s'assurer de l'identification.

Distinctus vient du latin et signifie « distinct ». Il faut peut-être y voir une volonté de montrer la différence de cette espèce par rapport à d'autres espèces proches.

Les dénominations française (limace noire), néerlandaise (donkere wegslak : limace sombre) et anglaise (Darkface arion) font référence à la couleur noire de ce mollusque, couleur qui est commune aux trois espèces du complexe « *Arion hortensis* ».
En langue allemande, cette espèce est nommée « Gemeine Wegschnecke ». Le caractère commun (Gemeine) est pourtant difficile à établir vu la difficulté d'identification entre les trois limaces formant le complexe « *A. hortensis* ».

Jules-François Mabille (1831-1901), l'auteur de la description, était un malacologue français.

Arion lusitanicus (Mabille, 1868)

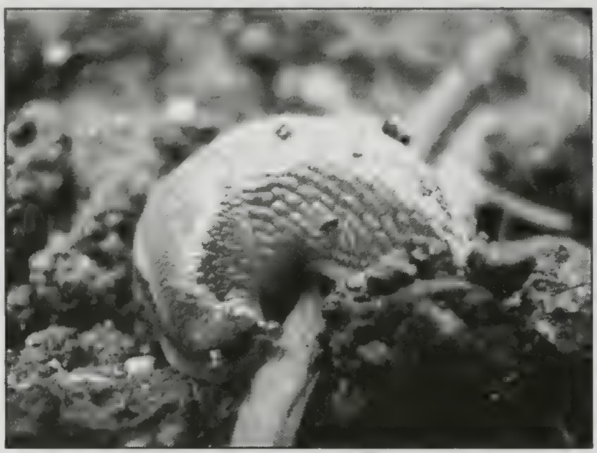
Le nom d'espèce *lusitanicus* fait référence à la Lusitanie, nom d'une province romaine qui, dans l'Antiquité, couvrait une partie du Portugal actuel. Le nom d'espèce est directement à mettre en relation avec l'aire de répartition d'origine de cette limace, à savoir la péninsule ibérique (Espagne, Portugal) et le sud-ouest de la France.

Cette référence à ces régions du sud de l'Europe se retrouve dans presque tous les noms communs attribués à cette espèce : limace ibérique (français), « Spaanse wegslak » (néerlandais), « Spanische Wegschnecke » (allemand), « Spanish slug » et « Lusitanian slug » (anglais), « Iberisk skovsnegl » (danois) ou « Espanjansiruetana » (finlandais).
Cet animal est relativement rare dans son aire d'origine, probablement suite aux conditions climatiques régnant dans ces régions (sécheresse et chaleur) et à la présence d'ennemis naturels.

C'est l'homme qui est responsable de sa présence hors de cette aire d'origine. Les échanges commerciaux de plantes en pots, à partir des exploitations horticoles, ont été identifiés comme le moyen de diffusion de cette espèce qui est qualifiée d'invasive.
Le développement de cette limace s'est considérablement accéléré ces dernières années. Jugez plutôt : Suède (1975), Pologne (1987), Norvège (1988), Finlande (1990 première mention, elle est présente dans tout le pays en 1994), Danemark (1991), îles Féroé (1996) et finalement l'Islande (2003).

Ni Adam (1960), dans sa « faune de Belgique » consacrée aux Mollusques terrestres et dulcicoles, ni De Wilde et al. (1986) dans leur « Atlas provisoire des Gastéropodes terrestres » ne font mention de cette espèce dans notre pays. Il faut attendre 1989 pour que Risch et Backeljau publient un article détaillant l'occurrence de cette espèce en Belgique.

Arion lusitanicus (Hof ter Musschen)
Sophie Valtat (SBM) - Copyright © 2010 CEBE-MOB


Arion lusitanicus (juvénile)) (Evere - jardin)
Jean-Philippe Coppée - Copyright © 2010 CEBE-MOB

Un peu plus petite que la grande limace rouge *Arion rufus* (10 à 15 cm), *A. lusitanicus* (7 à 10 cm) est actuellement la seule limace de couleur orangée observable sur nos sites. Assez étrangement, vu la quasi-omniprésence d'*Arion lusitanicus*, *A. rufus* n'a jamais été identifiée avec certitude sur aucun des 2 sites examinés. Pourtant, l'observation récente (14/05/2009) d'une limace noire de très grande taille au Walckiers (Michel Moreels, communication personnelle) tendrait à démontrer la présence d'*A. rufus* au moins sur un des 2 sites étudiés.
Néanmoins, lorsque l'animal est orangé, il est pratiquement impossible de distinguer ces deux espèces l'une de l'autre, sans passer par l'étape de la dissection.
La coloration de la limace ibérique est très variable, le plus souvent brune mais des individus brun foncé, orangés, voire jaunâtres peuvent être observés.
Les juvéniles d'*A. lusitanicus* présentent une bande latérale sombre, en forme de lyre, le long du corps. Cette bande peut être absente chez les adultes qui revêtent une couleur plus uniforme (voir photos). Le mucus est incolore et la sole est blanchâtre.
Animal essentiellement nocturne, il est le plus souvent observé au crépuscule ou après un épisode pluvieux

(à suivre)

Bibliographie sommaire

Les références ci-dessous reprennent les ouvrages et sites qui ont été les plus consultés. Certains sites Internet ont été consultés de manière sporadique afin de vérifier une orthographe, un détail ou de recouper une traduction. Ces sites ne sont pas repris dans cette bibliographie.

Les capacités d'Internet permettent par ailleurs de consulter des livres anciens, p.ex. datant du XIX$^{\text{ème}}$ siècle et qui ont permis de rechercher des étymologies parfois peu évidentes.

Enfin, il faut souligner le précieux site de l'association néerlandaise ANEMOON (ANalyse Educatie en Marien Oecologisch Onderzoek) qui a dédié une section entière à l'étymologie des mollusques continentaux des Pays-Bas. Ce site fut d'une importance capitale pour la structure des recherches et la rédaction de cet article.

ADAM William. Mollusques – Tome I : Mollusques terrestres et dulcicoles. Bruxelles : Patrimoine de l'IRSNB, 1960, 402 p. (Faune de Belgique)

ANEMOON (ANalyse Educatie en Marien Oecologisch Onderzoek). Atlasproject Nederlandse Mollusken : Etymologie [en ligne]. Disponible sur : <http://www.anemoon.org/anm/etymologie> (consulté les 2/08/2007 et 28/03/2008)

BACKELJAU T. et al. De Rode Lijst van de landslakken in Vlaanderen [en ligne]. Brussel : Instituut voor Natuurbehoud, en préparation. Disponible sur : http://www.inbo.be/content/page.asp?pid=BEL_VLA_SOO_rodelijst (consulté le 12.12.2006)

CUVIER F. Dictionnaire des sciences naturelles,... suivi d'une biographie des plus célèbres naturalistes [en ligne]. Paris : F.G. Levrault, 1818. Disponible sur : <http://books.google.fr/books?id=qmJIAAAAMAAJ> (dernière consultation février 2009)

JOURDAN A. J. L. Dictionnaire raisonné, étymologique, synonymique et polyglotte, des termes usités dans les sciences naturelles [en ligne]. Paris : Baillière, 1834. Disponible sur : <http://books.google.be/books?id=LlFhKnHEgSgC&hl=fr> (dernière consultation février 2009)

JUNGBLUTH J.H. et VON KNORRE D. Trivialnamen der Land- und Süßwassermollusken Deutschlands (Gastropoda et Bivalvia). In Mollusca 26 (1) Dresden, Allemagne, 2008, pp 105-156. Disponible sur : <http://globiz.sachsen.de/snsd/publikationen/mollusca-journal/mollusca_26-1-2008/08_Jungbluth.pdf>

KERNEY M.P., CAMERON R. et BERTRAND A. Guide des escargots et limaces d'Europe. Lausanne, Suisse : Delachaux et Niestlé, 1999, 370 p. (Les Guides du Naturaliste)

Muséum d'Histoire Naturelle de Göteborg (GNM) - CLECOM Project Checklist of species-group taxa of continental Mollusca living in Belgium. (CLECOM Section 1). Göteborg, Suède : Göteborgs Naturhistoriska Museum, 2002, 17 p.

Nederlandse Malacologische Vereniging. Soortenlijst Nederland – Landslakken [en ligne]. Disponible sur : <http://www.spirula.nl/malacologie/nl_soorten/nl_land.htm > (consulté le 21.11.2007)

Nederlandse Malacologische Vereniging. Soortenlijst Nederland - Zoet- en brakwater [en ligne]. Disponible sur : <http://www.spirula.nl/malacologie/nl_soorten/nl_zoet.htm> (consulté le 21.11.2007)

RISCH P. et BACKELJAU T. On the occurrence of *Arion lusitanicus* Mabille, 1868 in Belgium (Mollusca : Pulmonata) in Annales Société Royale de Zoologie de Belgique. T.118. Bruxelles : IRSNB, 1989, pp. 25-38.

Université Catholique de Louvain Itinera Electronica - Collatinus - Dictionnaire Jeanneau (Latin-Français) [en ligne]. Disponible sur <http://collatinus.fltr.ucl.ac.be/jano/> (dernière consultation février 2009)

Université de Neuchâtel. Liste des mollusques de Suisse [en ligne]. Neuchâtel, Suisse : Université de Neuchâtel, 2007. Disponible sur : <http://www2.unine.ch/webdav/site/cscf/shared/documents/liste_especes/MOL_2007.xls> (consulté le 25.04.2008)

VILVENS C. et al. Tome III : Gastéropodes terrestres sans coquille (limaces). Jodoigne, Belgique : Société Belge de Malacologie, 2008, 39 p. (Mollusques terrestres et dulcicoles de Belgique)

WAIENGNIER E. Relevé d'excursion au Moeraske. In Arion 24(1). Bruxelles : Société Belge de Malacologie, 1999, p 3

WEIDEMA I. (NOBANIS - North European and Baltic Network on Invasive Alien Species) – Invasive Alien Species Fact Sheet – *Arion lusitanicus* [en ligne]. Nobanis, 2006. Disponible sur : <www.nobanis.org/files/factsheets/Arion_lusitanicus.pdf> (consulté le 01.02.2008)

L'écho des réunions

Etienne MEULEMAN & Claude VILVENS

Réunion du 11 septembre 2010 (EM) → **Atelier Bernard l'Ermite** (Animateurs : Claude Vilvens & Etienne Meuleman - Avec la participation de tous)

Ce n'est pas la première fois que nous nous réunissons pour un atelier lors de nos réunions. Vu le succès remporté par les premières expériences, nous avons décidé de renouveler ce type de réunion. Mais pourquoi un atelier me direz-vous ? Simplement pour que les personnes présentent ne participent pas seulement de manière passive, mais qu'elles deviennent également des acteurs de la réunion.

Cette fois, nous avons choisi comme thème le Bernard l'ermite (ces crustacés qui « squattent » les coquilles). Le rôle des animateurs est d'introduire le sujet d'une manière générale, les participants sont ensuite invités à partager leur « savoir » en partageant à tour de rôle leurs connaissances sur le sujet ainsi que les « trésors » que recèlent leurs collections.

Claude nous présente l'atelier…

Voilà ce que nous avons pu découvrir sur le sujet :

En guise d'introduction…

Nous avons situé le Bernard l'ermite dans le règne animal :

- **Règne** : *Animalia*
  - **Embranchement** : *Arthropoda*
    - **Sous-embranchement** : *Crustacea*
      - **Classe** : *Malacostraca*
        - **Sous-classe** : *Eumalacostraca*
          - **Super-ordre** : *Eucarida*
            - **Ordre** : *Decpoda*
              - **Sous-ordre** : *Pleocyemata*
                - **Infra-ordre** : *Anomura*
                  - **Super-famille** : *Paguroidea* Latreille, 1802

La super-famille comporte 6 familles à savoir :

Coenobitidae Dana, 1851 (crabes des cocotiers)
Diogenidae Ortmann, 1892
Lithodidae Samouelle, 1819 (crabes royaux)
Paguridae Latreille, 1802 → Pagurus bernhardus (Bernard l'ermite)
Paraguridae Smith, 1882
Pylochelidae Bate, 1888 (pagures symétriques)

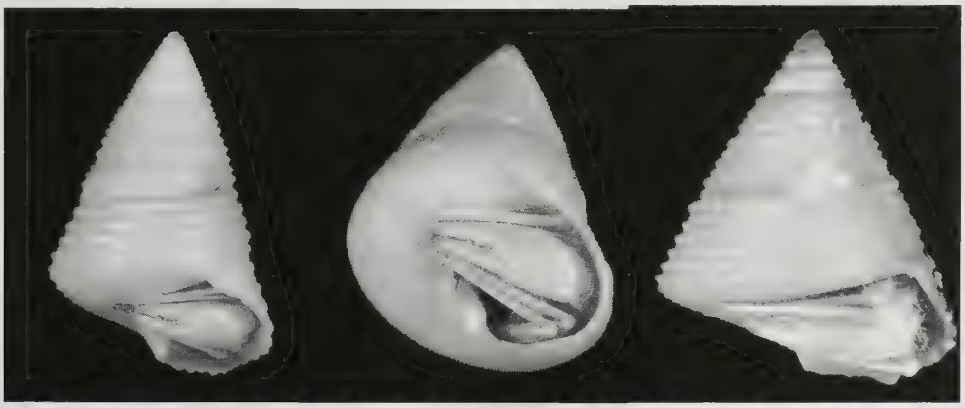
Remarque : Selon une phylogénétique récente, les *Lithodidae* en seraient exclus pour former une super-famille à part les *Hapalogastridae*. Apparaît une nouvelle famille : les *Pylojacquesidae.*

Revenons à la famille des *Paguridae* Latreille, 1802 et à la vedette de notre atelier : **le Bernard-l'ermite**.

Bernard l'ermite dans *Buccinum Undatum* (Méditerranée, 1962)

Il existe deux hypothèses possibles quant à l'origine du nom. D'une part on pense qu'il trouverait son origine de l'occitan languedocien *bernat-l'ermito*, *bernat* viendrait du prénom de Bernard de Clervaux et ermito du comportement animal. Une autre hypothèse nous apprend que le nom Bernard l'Ermite viendrait du celte *bernos* (aqueux, marécageux), mais cette étymologie ne semble pas satisfaisante car d'autres animaux, qui ne sont pas aquatiques, portent un nom occitan en *bernat* : par exemple *bernat-pudent* (punaise des bois).

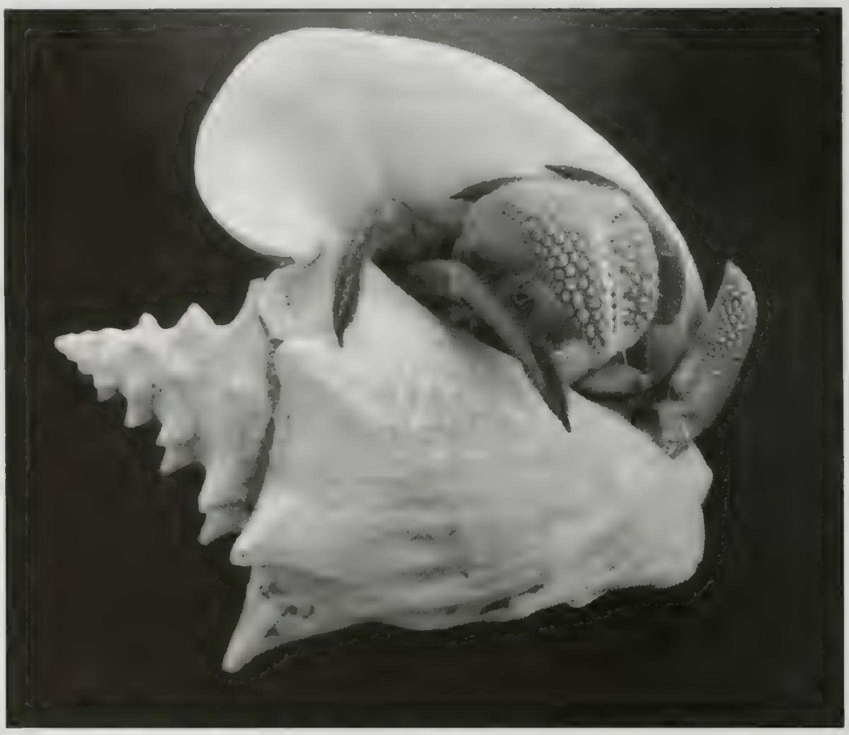
Le Bernard l'ermite se caractérise en général par la présence d'un abdomen mou courbé et tordu sans carapace. Il occupe donc des corps étrangers pour se protéger. En général, il choisit des coquilles de mollusques, mais il peut très bien s'abriter dans des éponges ou des morceaux de bambous. Le Bernard l'ermite est doté d'appendices abdominaux qui lui permettent de maintenir sa coquille. Le nombre de pattes locomotrices qu'il possède est réduit et la pince droite est de taille plus importante et sert bloquer l'entrée de la coquille.



Photos 1-2 :*Thysanodonta cassis* – Ride de Norfolk
Photo 3 :*Calliostoma boucheti* – Ride de Norfolk
(Photos : Claude Vilvens)

Les Bernard l'ermite sont amenés à chercher une coquille plus grande après chaque mue de manière à abriter leur corps qui devient de plus en plus grand.

La majorité des Bernard l'ermite est aquatique, mais certains vivent dans un environnement terrestre humide. Les plus gros peuvent atteindre 45cm. Dans certaines régions tropicales, ils comptent parmi les organismes les plus abondants et de nombreuses espèces sont découvertes chaque année.



Bernard l'ermite dans *Strombus Gigas* – Jacques Senders

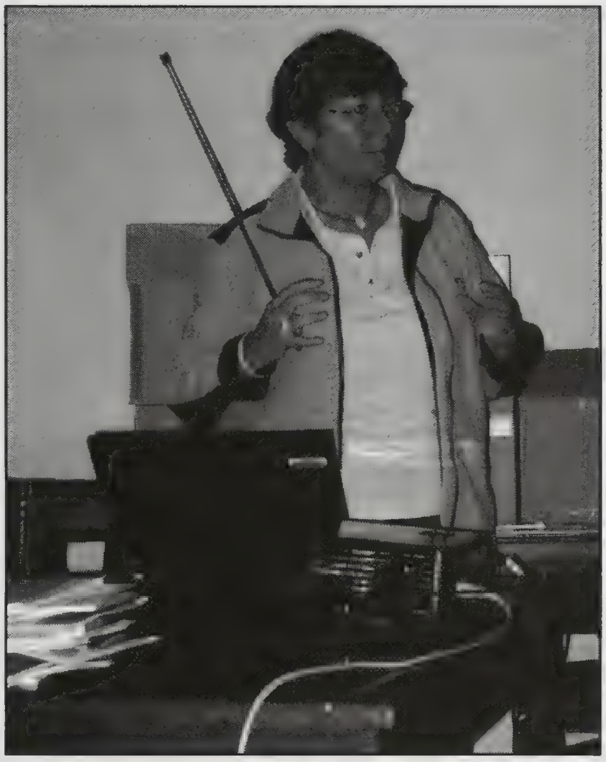
A gauche Annie Langleit nous présente ses trouvailles.
A droite Roland Scaillet nous fait découvrir des animaux conservés dans l'alcool.

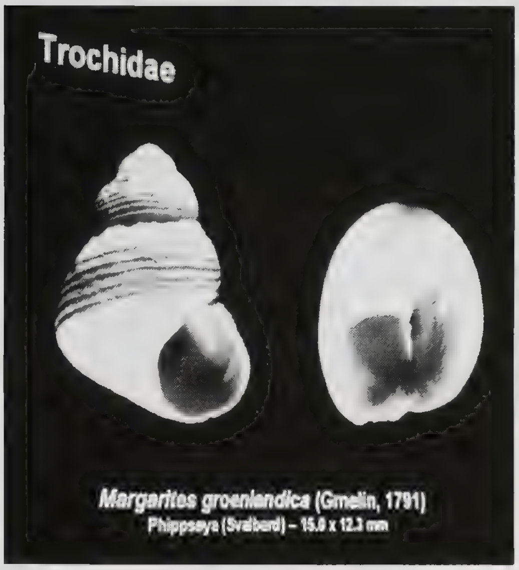
Réunion du 23 octobre 2010 (CV) → **Christiane Delongueville : Le Svalbard**

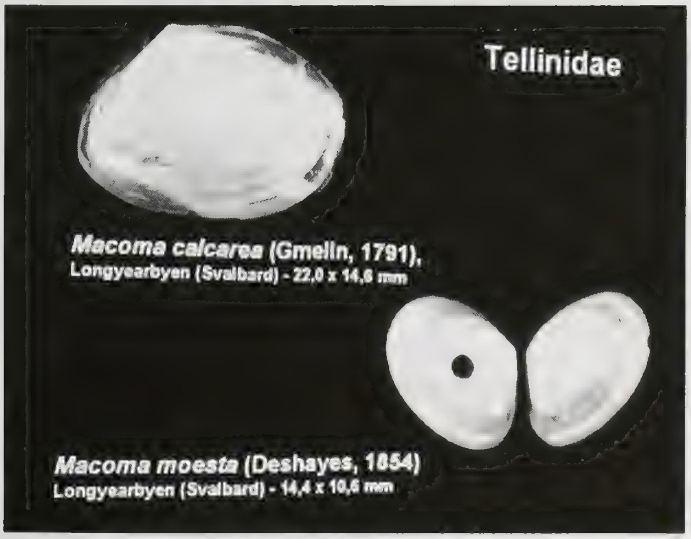
CANADA
OCÉAN
ARCTIQUE
RUSSIE
Groenland
Svalbard
74° - 81° N / 10° - 35° E

Cet archipel, situé dans la Mer de Barents à quelques 1000 km du Pôle Nord, est fait de paysages de banquise, de toundra, de glaciers et de montagnes.

En voyageant dans ce désert blanc, notre malacologue-naturaliste-globe-troter a illustré **la faune et la flore** si particulière de ces îles lointaines. Bien entendu, les **mollusques** ont occupé la meilleure place dans cet exposé magnifique et captivant ☺ !




Trochidae
Margarites groenlandica (Gmelin, 1791)
Phippsøya (Svalbard) – 15.6 x 12.3 mm


Tellinidae
Macoma calcarea (Gmelin, 1791),
Longyearbyen (Svalbard) - 22,0 x 14,6 mm
Macoma moesta (Deshayes, 1854)
Longyearbyen (Svalbard) - 14,4 x 10,6 mm

Nous avons reçu

Etienne Meuleman

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°254, juillet-août 2010

Sommaire

Page
Calendrier des activités 2
Comptes rendus des activités
- Identification des arbres en hiver 4
- Observations - découverte du castor sur la Lesse 10
- Visite de sites à anémone pulsatille à Resteigne, Belvaux et Auffe 12
- Matinée d'observation des oiseaux le long du Ravel entre Hour – Havenne et Houyet 14
- La végétation des pelouses schisteuses à Hour (Houyet) 15
- Visite de l'arboretum de Rendeux et promenade dans la vallée de l'Ourthe 18
- Orchidées de la région de Givet 20
- Prospection botanique à Froidlieu (Wellin) – Carré IFBL J6.32.32 26
- Les forêts de la Famenne schisteuse 28
- Prospection malacologique et naturaliste des dolines du versant ouest du massif de Boine à Han-sur-Lesse 33

Travaux des membres
- Compte-rendu de la migration des batraciens en 2010 (3ème année de l'opération) 35

Chroniques de l'environnement
- La pollution du Ri d'En Faule à Wavreille 37
- Le trou Maulin défiguré 39
- Les tilleuls du centre urbain de Rochefort 39

LES NATURALISTES DE LA HAUTE LESSE

(Belgique)
N°255, septembre-octobre 2010

Sommaire

Page
Calendrier des activités 2
Comptes rendus des activités
- Inventaire et observations biologiques diverses sur le site de la Fange Mariette et ses abords (Libin) 4
- Journée de la biodiversité: Inventaire pluridisciplinaire dans la vallée du Vachau 7
- Prospection dans la vallée du ruisseau de Tailsus, un affluent de la Lomme (Fanges Bubu et de Tailsus) 12
- Promenade dans les bois de Resteigne: l'Osmonde royale 16
- Session naturaliste en Normandie (Cotentin) 19
- Sur les chasses et pêches de Léopold Ier. Randonnée naturaliste dans les domaines de Custinne 28
- Prospection vélocipédique à la recherche des hirondelles(Han, Belvaux, Auffe, Lessive, Eprave) 31
- La vallée du Houyoux à Rhisnes (Namur) 33

Chroniques de l'environnement
- Le RAVel à Ciergnon – Menaces sur le Chemin de la Collyre... 36
- Surfréquentation et protection de la grotte d'Eprave (Rochefort) 37

Informations : souper des naturalistes 39

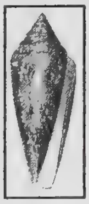
LES NATURALISTES BELGES

(Belgique)
Vol. 91, N°1-2, 2010

Des articles sur les Iguanodons et les dauphins.

GLORIA MARIS

(Belgique néerlandophone)
Vol. 49, N°2, 2010



CONTENTS

1. *J. A. Buijse & G. Verbinnen*
Red Sea Mollusca: Contribution to the knowledge of *Conus* (*Pionoconus*) *nigropunctatus* G.B. Sowerby II, 1858.

2. *E. Rolán*
A new species of the genus *Aroapyrgus* (Prosobranchia, Cochliopinae) from Guatemala

SPIRULA

(Pays-Bas)
N° 373, 2010

	Voorplaat.	41
Diverse bronnen	Malacologische agenda en excursies - 2010	41
Bestuur	Fossiele Schelpen van de Nederlandse Stranden en Zeegaten	42
Gerhard C.Cadée	Vogels leren beter hoe muiltjes te eten	42
Jan Kuiper	Een *Strombus gigas* in het hoge Noorden	43
Peter van Moerdijk	Schadelijk voor of dienstbaar aan de natuur?	44
Henk K. Mienis	Over Derk. A. Visker en zijn molluskenverzameling	45
Jan Kuiper	Boekbespreking: Schelpdieren, verrukkelijk veelzijdig	46
Egge Knol	Tweede kerstdag: kleine boormossels, *Barnea parva*, in veen en hout op het strand van Terschelling	47
Gerhard C. Cadée & Hans Cadée-Coenen	*Timoclea grus* (Holmes, 1858) en andere tropische tweekleppigen van een op Texel aangespoelde gascylinder	49
F.F.L.M. Titselaar	Conidae van Kaapverdië. In 1990 verzameld door Jan-Paul Buijs	52
Jan Kuiper	Boekbespreking: Clams, Oysters & Scallops	57
Jan Kuiper	Boekbespreking: Good Tidings, the history and ecology of shellfish farming in the North-east	57
W. Faber	Nieuwe weekdiersoorten (schelpen) / new shelled molluscan species	58
W. Faber	Tijdschriftartikelen / Journal papers	60
W. Faber	Schelpenbeurzen en bijeenkomsten / International shell shows and meetings	64

SPIRULA

(Pays-Bas)
N° 374, 2010

Diverse bronnen	Excursies + Malacologische agenda Nederland - 2010	65
A.C. van Bruggen	In memoriam Prof. Dr Joos Joosse, 1930-2010	67
H. Raad	Molluskeninventarisatie Bathse Spuikanaal en omgeving (Zuid-Beveland, prov. Zeeland)	68
A. W. Janssen	De segrijnslak, Cornu aspersum (Müller, 1774) en de economie van het grondstoffenbeheer, of: hoe een objectieve waarneming tot foutieve conclusies kan leiden	70
S. van Leeuwen	De geboorte van het boek “Kruipende huisjes” van Bert Jansen	72
S. van Leeuwen, W. Kuijper & T. Neckheim	De mollusken van Griend 2009 Verslag van een inventarisatie in het kader van het Project Habslak en het Atlasproject Nederlandse Mollusken	75
R.S.E.W. Leuven & G. van der Velde	Meeliftende landslakken: verspreiding van de segrijnslak Cornu aspersum (O.F. Müller 1774) door auto’s	82
C.M. Neckheim	De in Nederland gevonden “verkeerd” gewonden Gastropoda op een rij!	83
R.A. Bank	Nieuw beschreven continentale molluskensoorten – (new taxa: continental molluscs)	93
R.A. Bank	Artikelen in tijdschriften - (journal papers: continental malacology)	93
R.A. Bank	Nieuwe boeken - new books	98
-	Excursie programma Gloria Maris 2010	99

XENOPHORA

(France)
N°130, avril-mai-juin 2010

4 Le coin du Débutant par G. Jaux
6 C'est petit mais c'est joli ! par G. Lhaumet
7 *Ancilla eloisae* par G. Lhaumet
8 Les types du MNHN par A. Robin
11 Nouvelles définitions de Fasciolariidae par D. Mallard
16 Enez Vaz par A. Robin et J-L. Delemarre
20 Un après-midi au Muséum de Genève par F. Semper-Parras et M. Bouteiller
22 Identifiez-moi !
24 Mythique *Gracilis* par S. Guyonneau
25 Madagascar côte sud-ouest par P. Lefèbvre
27 Bourse de Rennes par J. Basset
28 L'actu du Web par B. Mathé
29 Investigations marocaines par P. Dardart
31 Lu pour vous par R. Houart
32 Reçu au Club par P. Bail
34 Echo...coquillages

MOLLUSC WORLD

(Grande-Bretagne)
N°22, mars 2010

CONTENTS

John Ray's hermaphrodite snails on their 350th anniversary *Aydın Örstan* 3

ARKive and the search for mollusc imagery 4

***Granaria frumentum* on the Isles of Scilly** *Barry Colville/Adrian Norris* 5

***Hygromia cinctella*, more localities** *Adrian Brokenshire* 5

Book Review: Land snails of Russia and adjacent countries *Robert Cameron* 6

Field trip: Sherwood Forest area, Nottinghamshire *Chris du Feu* 7

Coquilles in the kitchen *J.E.Llewellyn-Jones* 8

Leeds Regional Meeting *Terry Crawford* 10

***Helix lucorum* in Wimbledon, S.W. London** *Phil Palmer* 12

Non-Marine Recording – Activity and Highlights 2009 *Adrian Norris* 13

Marine Recorder's Report 2009 *Jan Light* 15

Poetical responses to "The Limpet" 18

Shells Revealed in Unusual Places *Janet Sawyer* 21

Honorary Treasurer's Report *Nick Light* 22

***Rangia cuneata* in Belgian waters** *Adrian Brokenshire* 23

Down Memory Lane ... *Janet Ridout Sharpe* 24

David Long "On the spot" 25

Ormers and scallops: a Fishy Tale from Alderney *John Glasgow* 26

Book Reviews *Kevin Brown* 27

Kerry Slug survey 28

Recording, collections and protected species *Bas Payne* 29

Calendar of meetings and events 30-31

CLUB CONCHYLIA MITTEILUNGEN

(Allemagne-Autriche)
N°14, 2010

Inhalt

Vorwort des I. Vorsitzenden 4
KLAUS KITTEL: Einladung zur Börse und JHV 2010 5
Personalia 5
In eigener Sache (Club-T-Shirt) 5
Wir gratulieren 6
Aus dem Clubleben 6
    ErneuteEinladung Regionaltreffen Ost 6
    INGO KURTZ: Regionaltreffen in Mittelhessen 6
    KLAUS & THERESIA KITTEL: 4. deutsch-schweizer Reginonaltreffen in München 7
    KLAUS KITTEL: Bericht über die außerordentliche Mitgliederversammlung 8
    Termine 9
    KLAUS & THERESIA KITTEL: Bilder vom Regionalstammtisch West 10
    KLAUS & THERESIA KITTEL: Bilder von der Börse Antwerpen 11
DIRK FEHSE: Die Morphometrie – ihre Möglichkeiten, ihre Grenzen 12
ROLAND HOFFMANN: Anmerkungen zu *Marginella lineatolabrum* - ein Fehler pflanzt sich fort 15
ROLAND HOFFMANN: Konfusion um „*Marginella avenacea* DESHAYES 1844“ 16
INGO KURTZ: Sammeln auf Kos im Frühjahr 2009 19
ROLAND HOFFMANN: Fortschreitende Globalisierung in allen Bereichen 25
KLAUS GROH: SEPP LINGL – ein Kupferstecher 27
SIGURD-DIETER HAMSCHER: Weihnachts-Urlaub 2010 auf der Insel Djerba/Tunesien 28
KLAUS KITTEL: Der Junge Schneckensammler (10): Muschelseide 29
Presseschau 31
H. DEBELIUS, K. GROH, R. HOFFMANN, K. KITTEL, B. NEVILLE: Buchbesprechungen 36
Club-Händler werben bei Club-Mitgliedern 49

ARCHIV FUR MOLLUSKENKUNDE

(Allemagne)
Vol. 139, N°1, 2010

GLOËR, P., BOUZID, S. & BOETERS, H.D.: Revision of the genera *Pseudamnicola* PALUCCI 1878 and *Mercuria* BOETERS 1971 from Algeria with particular emphasis on museum collections (Gastropoda: Prosobranchia: Hydrobiidae)........ 1-22

FEHSE,D. & GREGO,J.: Contributions to the knowledge of the Triviidae XX. A new species from the genus *Niveria* JOUSSEAUME 1884 (Mollusca: Gastropoda: Prosobranchia)........ 23-33

DELL'ANGELO,B., SABELLI, B., TAVIANI, M. & BONFITO, A.: New data on the Polyplacophora of Madagascar (Western Indian Ocean) (Mollusca: Polyplacophora)........ 35-43

NORDSIEK, H.: New taxa of the subfamilies Neniinae and Garnieriinae (Gastropoda: Stylommatophora: Clausiliidae)........ 45-69

EMBERTON, K.C., SLAPCINSKY, J., CAMBELL, C.A., RAKOTONDRAZAFY, J.A., ANDRIANMIARISON, T.N. & EMBERTON, J.D.: Terrestrial mollusks of Andriantantely Massif, Eastern Madagascar, with description of 36 new species (Gastropoda: Caenogastropoda; Pulmonata)........ 71-141

ATTI DEL MUSEO CIVICO DI STORIA NATURALE DI TRIESTE

Vol.54, 2009

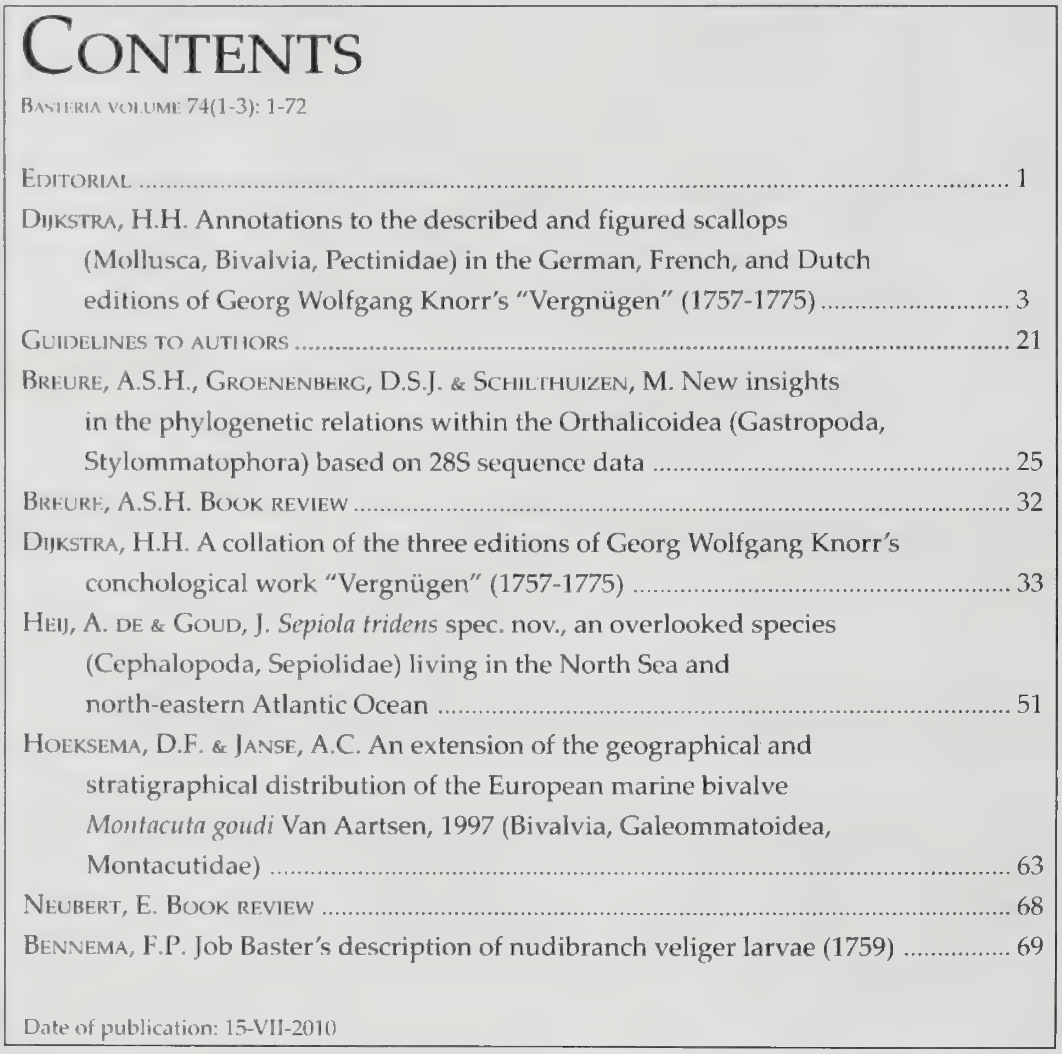
Divers articles sur les coléoptères, les amphibiens,...
Deux articles nous intéressent plus particulièrement dans la publication :

WILLY DE MATTIA, MASSIMO PRODAN – I molluschi (Gastropoda : *Architaenioglossa, Pulmonata, Bivalvia*) della Val Rosandra (Trieste-Italia)........165

ENNO VIO & GIORGIO VALLI – La malacofauna di aleuni sollevamenti morfologici marini del Golfo di Trieste (Alto Adriatico)........301

BASTERIA

(Pays Bas)
Vol. 74, N° 1-3, 2010



CONTENTS

Basteria volume 74(1-3): 1-72

Editorial 1

Dijkstra, H.H. Annotations to the described and figured scallops (Mollusca, Bivalvia, Pectinidae) in the German, French, and Dutch editions of Georg Wolfgang Knorr's "Vergnügen" (1757-1775) 3

Guidelines to authors 21

Breure, A.S.H., Groenenberg, D.S.J. & Schilthuizen, M. New insights in the phylogenetic relations within the Orthalicoidea (Gastropoda, Stylommatophora) based on 28S sequence data 25

Breure, A.S.H. Book review 32

Dijkstra, H.H. A collation of the three editions of Georg Wolfgang Knorr's conchological work "Vergnügen" (1757-1775) 33

Heij, A. de & Goud, J. *Sepiola tridens* spec. nov., an overlooked species (Cephalopoda, Sepiolidae) living in the North Sea and north-eastern Atlantic Ocean 51

Hoeksema, D.F. & Janse, A.C. An extension of the geographical and stratigraphical distribution of the European marine bivalve *Montacuta goudi* Van Aartsen, 1997 (Bivalvia, Galeommatoidea, Montacutidae) 63

Neubert, E. Book review 68

Bennema, F.P. Job Baster's description of nudibranch veliger larvae (1759) 69

Date of publication: 15-VII-2010

BOLLETINO MALACOLOGICO

(Italie)
Vol. 46, N° 1, 2010

Indice

1 *Maurizio Sosso & Bruno Dell'Angelo*
Prima segnalazione di ***Otina ovata*** (Brown, 1827) (Systellomatophora: Otinidae) in Mediterraneo

4 *M. Mauro Brunetti & Maurizio Forli*
Murexsul zezae n. sp. del Pliocene Italiano (Gastropoda: Muricidae)

9 *Bruno Dell'Angelo & Enrico Schwabe*
Teratology in chitons (Mollusca, Polyplacophora): a brief summary

16 *Erminio Caprotti*
Antiporte malacologiche del Settecento

29 *Rafael La Perna & Mauro D'Abramo*
Una collezione di G. Seguenza conservata presso l'Istituto Tecnico Commerciale "O.G. Costa" di Lecce

36 *Eivind Palm & Bruno Dell'Angelo*
Lembulus forlii n. sp. from the Pliocene of Italy (Bivalvia, Nuculanidae)

39 *M. Mauro Brunetti & Giano Della Bella*
Tellina (Moerella) ciucianensis n. sp., un nuovo bivalve per il Pliocene toscano

NOTICIARIO DE LA SOCIEDAD ESPAÑOLA DE MALACOLOGIA

(Espagne)
N°53, 2010

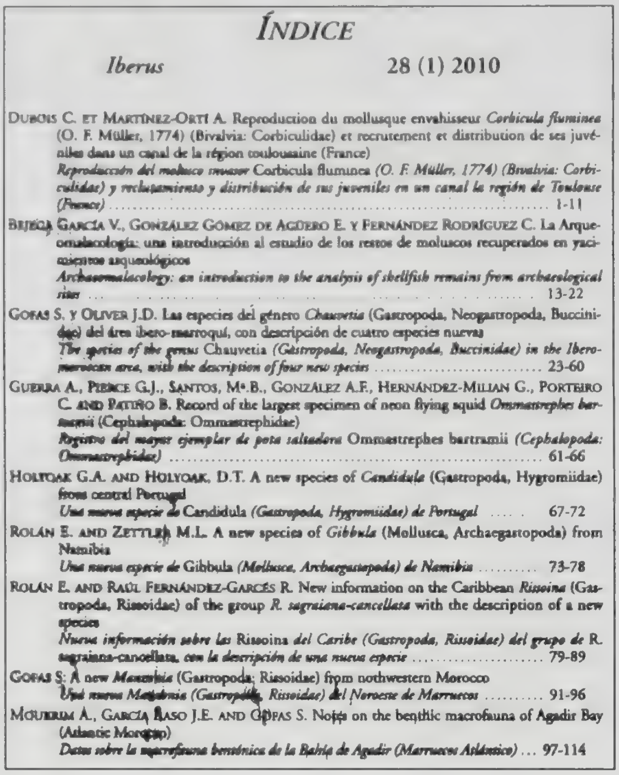
INDICE

Editorial 3
Secretaria 4
Tesorería 5
Noticias Malacológicas 9
Colaboraciones
- Distribution range of *Parastrophia asturiana* (Mollusca, Caecidae) 22
- Dos nuevas citas de Gasterópodos marinos (familia Conidae) en Galicia 24
- Nueva información sobre *Clathrosansonia cubensis* (Gastropoda, Pickworthiidae) 26
- Una curiosidad: *Neptunea contraria* "contraria" 28
- Distribution area of *Pseudorbis granulum* (Prosobranchia, Skeneidae) 29
- Nova informação sobre *Belgrandia lusitanica* (Paladilhe, 1867) (Caenogastropoda, Hydrobiidae) Materiais para o estudo da Malacolfauna não-marinha de Portugal. 8 31
- *Pholas dactylus* y *Barnea candida* en Galicia (Bivalvia, Pholadidade) 34
- Inventario faunístico de Moluscos actualizado del Principat D'Adorra con la adición de cuatro nuevas especies 36
- Moluscos de interés alimenticio en México 39
- Nuevas citas de dispersión de la almeja asiática *Corbicula fluminea* (Müller, 1774) en Andalucía y algunos datos de interés cronológico y bibliográfico 42
- Cita de *Helix lucorum* Linnaeus, 1758 (Gastropoda: Helicidae) en Navarra (España) 43
- Datos recientes sobre la distribución y el estado de conservación del higrómido amenazado *Xerosecta explanata* (O.F. Müller, 1774) 45

Relatos cortos 49
Las mejores fotos de nuestros socios 51
Indices de Revistas 52
Pasatiempos 82

IBERUS

(Espagne)
Vol. 28, N° 1, 2010



ÍNDICE

Iberus 28 (1) 2010

Dubois C. et Martínez-Ortí A. Reproduction du mollusque envahisseur *Corbicula fluminea* (O. F. Müller, 1774) (Bivalvia: Corbiculidae) et recrutement et distribution de ses juvéniles dans un canal de la région toulousaine (France)
Reproducción del molusco invasor Corbicula fluminea *(O. F. Müller, 1774) (Bivalvia: Corbiculidae) y reclutamiento y distribución de sus juveniles en un canal la región de Toulouse (France)* 1-11

Bejega García V., González Gómez de Agüero E. y Fernández Rodríguez C. La Arqueomalacología: una introducción al estudio de los restos de moluscos recuperados en yacimientos arqueológicos
Archaeomalacology: an introduction to the analysis of shellfish remains from archaeological sites 13-22

Gofas S. y Oliver J.D. Las especies del género *Chauvetia* (Gastropoda, Neogastropoda, Buccinidae) del área ibero-marroquí, con descripción de cuatro especies nuevas
The species of the genus Chauvetia *(Gastropoda, Neogastropoda, Buccinidae) in the Ibero-moroccan area, with the description of four new species* 23-60

Guerra A., Pierce G.J., Santos, Mª.B., González A.F., Hernández-Milian G., Porteiro C. and Patiño B. Record of the largest specimen of neon flying squid *Ommastrephes bartramii* (Cephalopoda: Ommastrephidae)
Registro del mayor ejemplar de pota saltadora Ommastrephes bartramii *(Cephalopoda: Ommastrephidae)* 61-66

Holyoak G.A. and Holyoak, D.T. A new species of *Candidula* (Gastropoda, Hygromiidae) from central Portugal
Una nueva especie de Candidula *(Gastropoda, Hygromiidae) de Portugal* 67-72

Rolán E. and Zettler M.L. A new species of *Gibbula* (Mollusca, Archaegastopoda) from Namibia
Una nueva especie de Gibbula *(Mollusca, Archaegastopoda) de Namibia* 73-78

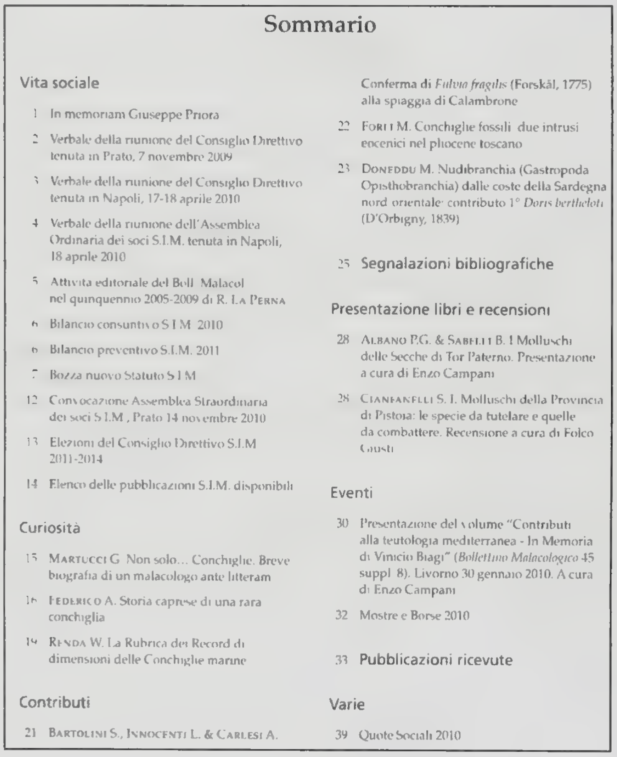
Rolán E. and Raúl Fernández-Garcés R. New information on the Caribbean *Rissoina* (Gastropoda, Rissoidae) of the group *R. sagraiana-cancellata* with the description of a new species
Nueva información sobre las Rissoina *del Caribe (Gastropoda, Rissoidae) del grupo de* R. sagraiana-cancellata, *con la descripción de una nueva especie* 79-89

Gofas S: A new *Manzonia* (Gastropoda: Rissoidae) from nothwestern Morocco
Una nueva Manzonia (Gastropoda, Rissoidae) del Noroeste de Marruecos 91-96

Mouedim A., García Raso J.E. and Gofas S. Notes on the benthic macrofauna of Agadir Bay (Atlantic Morocco)
Datos sobre la macrofauna bentónica de la Bahía de Agadir (Marruecos Atlántico) ... 97-114

NOTIZIARIO S.I.M.

(Italie)
Vol. 28, N°1, 2010



Sommario

Vita sociale

1 In memoriam Giuseppe Priora
2 Verbale della riunione del Consiglio Direttivo tenuta in Prato, 7 novembre 2009
3 Verbale della riunione del Consiglio Direttivo tenuta in Napoli, 17-18 aprile 2010
4 Verbale della riunione dell'Assemblea Ordinaria dei soci S.I.M. tenuta in Napoli, 18 aprile 2010
5 Attività editoriale del Boll. Malacol. nel quinquennio 2005-2009 di R. La Perna
6 Bilancio consuntivo S.I.M. 2010
6 Bilancio preventivo S.I.M. 2011
7 Bozza nuovo Statuto S.I.M.
12 Convocazione Assemblea Straordinaria dei soci S.I.M., Prato 14 novembre 2010
13 Elezioni del Consiglio Direttivo S.I.M 2011-2014
14 Elenco delle pubblicazioni S.I.M. disponibili

Curiosità

15 Martucci G. Non solo... Conchiglie. Breve biografia di un malacologo ante litteram
16 Federico A. Storia caprese di una rara conchiglia
19 Renda W. La Rubrica dei Record di dimensioni delle Conchiglie marine

Contributi

21 Bartolini S., Innocenti L. & Carlesi A. Conferma di *Fulvia fragilis* (Forskål, 1775) alla spiaggia di Calambrone
22 Forti M. Conchiglie fossili: due intrusi eocenici nel pliocene toscano
23 Doneddu M. Nudibranchia (Gastropoda Opisthobranchia) dalle coste della Sardegna nord orientale: contributo 1° *Doris bertheloti* (D'Orbigny, 1839)

25 Segnalazioni bibliografiche

Presentazione libri e recensioni

28 Albano P.G. & Sabelli B. I Molluschi delle Secche di Tor Paterno. Presentazione a cura di Enzo Campani
28 Cianfanelli S. I. Molluschi della Provincia di Pistoia: le specie da tutelare e quelle da combattere. Recensione a cura di Folco Giusti

Eventi

30 Presentazione del volume "Contributi alla teutologia mediterranea - In Memoria di Vinicio Biagi" (*Bollettino Malacologico* 45 suppl. 8). Livorno 30 gennaio 2010. A cura di Enzo Campani
32 Mostre e Borse 2010

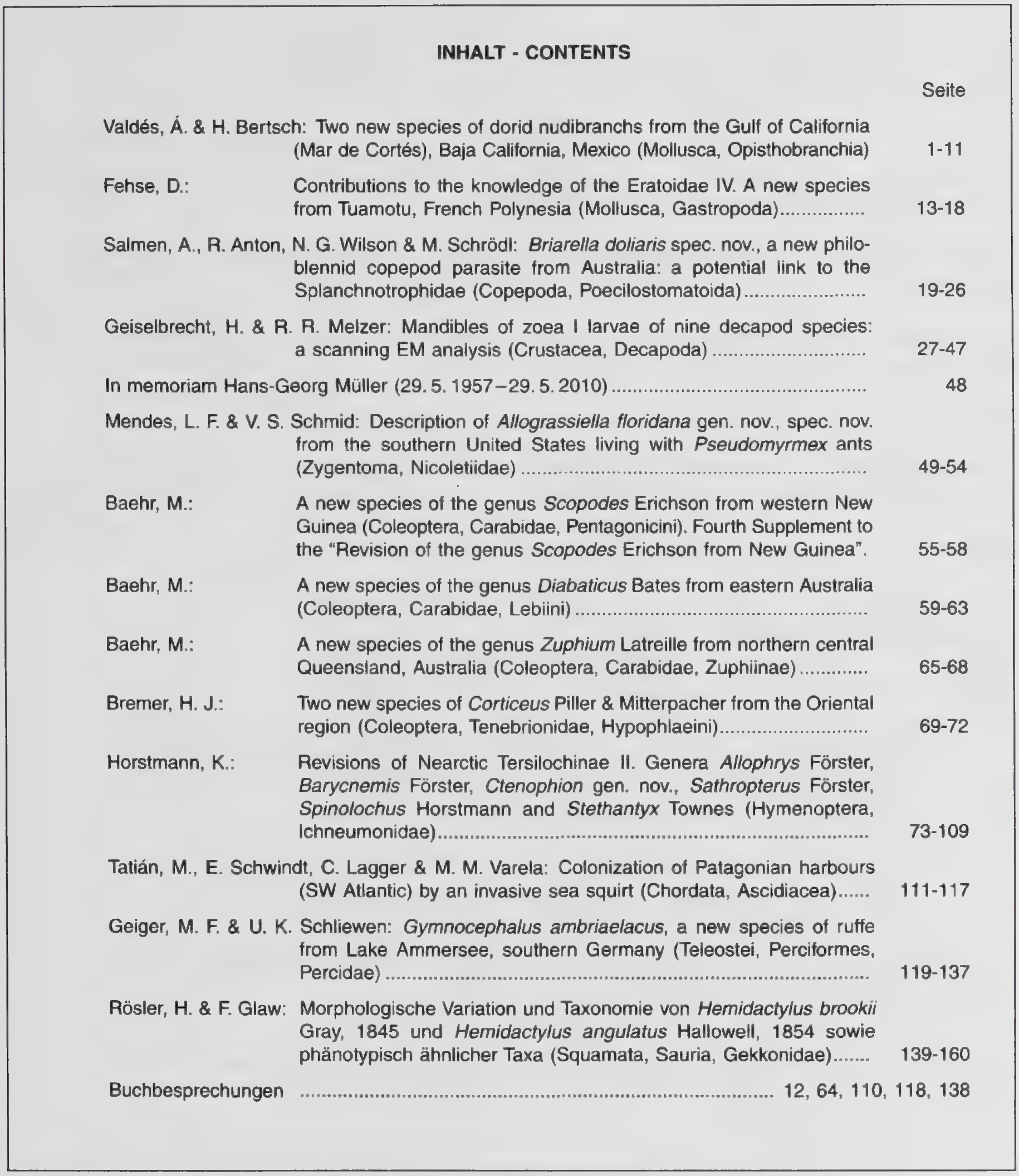
33 Pubblicazioni ricevute

Varie

39 Quote Sociali 2010

SPIXIANA

(Allemagne)
Vol. 33, N°1, 2010



INHALT - CONTENTS

Seite

Valdés, Á. & H. Bertsch: Two new species of dorid nudibranchs from the Gulf of California (Mar de Cortés), Baja California, Mexico (Mollusca, Opisthobranchia) 1-11

Fehse, D.: Contributions to the knowledge of the Eratoidae IV. A new species from Tuamotu, French Polynesia (Mollusca, Gastropoda)............... 13-18

Salmen, A., R. Anton, N. G. Wilson & M. Schrödl: *Briarella doliaris* spec. nov., a new philoblennid copepod parasite from Australia: a potential link to the Splanchnotrophidae (Copepoda, Poecilostomatoida)...................... 19-26

Geiselbrecht, H. & R. R. Melzer: Mandibles of zoea I larvae of nine decapod species: a scanning EM analysis (Crustacea, Decapoda)............................ 27-47

In memoriam Hans-Georg Müller (29. 5. 1957–29. 5. 2010).. 48

Mendes, L. F. & V. S. Schmid: Description of *Allograssiella floridana* gen. nov., spec. nov. from the southern United States living with *Pseudomyrmex* ants (Zygentoma, Nicoletiidae).. 49-54

Baehr, M.: A new species of the genus *Scopodes* Erichson from western New Guinea (Coleoptera, Carabidae, Pentagonicini). Fourth Supplement to the "Revision of the genus *Scopodes* Erichson from New Guinea". 55-58

Baehr, M.: A new species of the genus *Diabaticus* Bates from eastern Australia (Coleoptera, Carabidae, Lebiini).. 59-63

Baehr, M.: A new species of the genus *Zuphium* Latreille from northern central Queensland, Australia (Coleoptera, Carabidae, Zuphiinae)............ 65-68

Bremer, H. J.: Two new species of *Corticeus* Piller & Mitterpacher from the Oriental region (Coleoptera, Tenebrionidae, Hypophlaeini)........................... 69-72

Horstmann, K.: Revisions of Nearctic Tersilochinae II. Genera *Allophrys* Förster, *Barycnemis* Förster, *Ctenophion* gen. nov., *Sathropterus* Förster, *Spinolochus* Horstmann and *Stethantyx* Townes (Hymenoptera, Ichneumonidae)... 73-109

Tatián, M., E. Schwindt, C. Lagger & M. M. Varela: Colonization of Patagonian harbours (SW Atlantic) by an invasive sea squirt (Chordata, Ascidiacea)...... 111-117

Geiger, M. F. & U. K. Schliewen: *Gymnocephalus ambriaelacus*, a new species of ruffe from Lake Ammersee, southern Germany (Teleostei, Perciformes, Percidae).. 119-137

Rösler, H. & F. Glaw: Morphologische Variation und Taxonomie von *Hemidactylus brookii* Gray, 1845 und *Hemidactylus angulatus* Hallowell, 1854 sowie phänotypisch ähnlicher Taxa (Squamata, Sauria, Gekkonidae)....... 139-160

Buchbesprechungen 12, 64, 110, 118, 138

MALACOLOGIA – Mostra mondiale Cupra Maritima

(Italie)
N°66 et 67, 2010

Des nombreuses nouvelles espèces de cônes, natices, casques, volutes,…

MISCELLANEA MALACOLOGICA

(Pays-Bas)
Vol. 4, N°2, Juin 2010

VOLUME 4 23 JUNE 2010 NUMBER 2

Contents:

R. G. Moolenbeek & J. Hoenselaar. Bizarre micromolluscs: *Sanciaella minahasa*, a new genus and species from Indonesia, Sulawesi [Gastropoda: Aclididae (?)] 13

R. G. Moolenbeek. The occurence of *Meiocardia vulgaris* (Reeve, 1845) in the Sultanate of Oman (Bivalvia: Glossidae). 16

R. G. Moolenbeek & J. Hoenselaar. A new genus and species, *Kaseilla sanciae*, from the Moluccas, Indonesia (Gastropoda: Pickworthiidae) 17

R. G. Moolenbeek. New Conidae records to the fauna of the Sultanate of Oman 20

L. J. Van Gemert & R. G. Moolenbeek. Elly Koperberg (1897-1943): a necrology - better late than never -, with some notes on her new malacological taxa. 21

Corrections. 26

MOLLUSCAN RESEARCH

(Australie)
Vol. 26, N°2, septembre 2006

57 **Colonization of Asian freshwaters by the Mytilidae (Bivalvia): a comparison of *Sinomytilus harmandi* from the Tonle-Sap River, Phnom Penh, Cambodia, with *Limnoperna fortunei***
BRIAN MORTON & GRETE E. DINESEN

73 **Differentiation according to body region and interspecific variation in the morphology of integumentary spicules of nudibranchs**
CHING-HUNG CHANG, HIN-KIU MOK, LI-GIN HUANG & YEN-WEI CHANG

81 **Field observations of mating in *Octopus tetricus* Gould, 1852 and *Amphioctopus marginatus* (Taki, 1964) (Cephalopoda: Octopodidae)**
CHRISTINE L. HUFFARD & PETER GODFREY-SMITH

87 **Comparative anatomy and taxonomy of *Onchidium vaigiense* (Gastropoda: Pulmonata: Onchidiidae)**
BENOÎT DAYRAT

102 **Effects of low temperature on the schistosome-transmitting snail *Oncomelania hupensis* and the implications of global climate change**
YI-BIAO ZHOU1, JIAN-LIN ZHUANG, MEI-XIA YANG, ZHI-JIE ZHANG, JIAN-GUO WEI, WEN-XIANG PENG, GEN-MING ZHAO, SI-MING ZHANG & QING-WU JIANG

109 **A new *Connexiscala* (Mollusca: Gastropoda: Epitoniidae) from the bathyal zone of the Gulf of Aden**
ANTONIO BONFITTO

113 **Karyotypes in *Onchidium struma* (Gastropoda: Pulmonata: Systellommatophora)**
HEDING SHEN, LING WANG, XINXIN DAI & ZHIYI SHI

KEPPEL BAY TIDINGS

(Australie – Queensland)
Vol. 49, N° 1, mars-mai 2010

- K. WHITTINGTON: Vanuatu Shells 2009
- M. PEACH: *Choreotyphis pavlova* (Iredale 1936)
- Eight National shell show Freemantle Western Australia
- E. COUCOM: Concluding the Cymbiolas

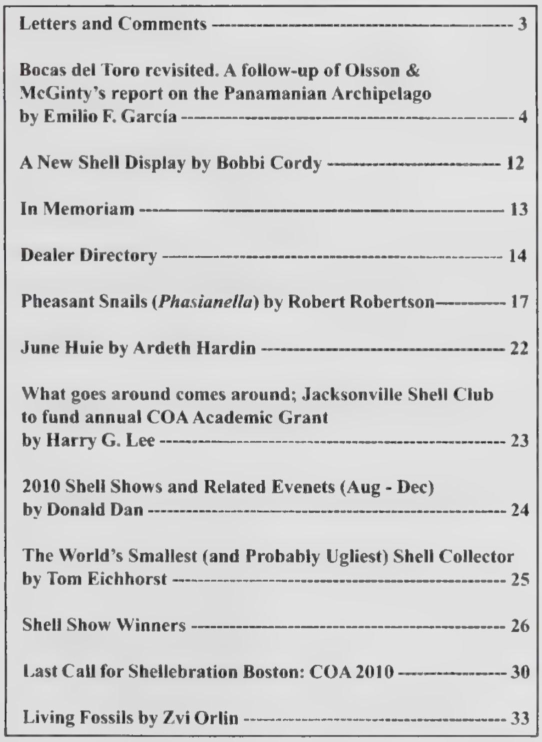
KEPPEL BAY TIDINGS

(Australie – Queensland)
Vol. 49, N° 2, Juin – Août 2010

- Wow! – What a shell show!
- T. WHITEHEAD: Shells are where you find them
- Don Harris, gentleman fisher, still plying his craft
- The Ericusa genus
- Leptoscapha genus
- Strating the Livonia genus

AMERICAN CONCHOLOGIST

(U.S.A. Sud-Est)
Vol. 38, N° 2, 2010



Letters and Comments ---------- 3

Bocas del Toro revisited. A follow-up of Olsson & McGinty's report on the Panamanian Archipelago by Emilio F. García ---------- 4

A New Shell Display by Bobbi Cordy ---------- 12

In Memoriam ---------- 13

Dealer Directory ---------- 14

Pheasant Snails (*Phasianella*) by Robert Robertson ---------- 17

June Huie by Ardeth Hardin ---------- 22

What goes around comes around; Jacksonville Shell Club to fund annual COA Academic Grant by Harry G. Lee ---------- 23

2010 Shell Shows and Related Evenets (Aug - Dec) by Donald Dan ---------- 24

The World's Smallest (and Probably Ugliest) Shell Collector by Tom Eichhorst ---------- 25

Shell Show Winners ---------- 26

Last Call for Shellebration Boston: COA 2010 ---------- 30

Living Fossils by Zvi Orlin ---------- 33

THE VELIGER

(U.S.A. – Californie)
Vol. 51, N°1, 2010

CONTENTS

A Revised Classification of the Gastropod Genus *Nerita*
MELISSA A. FREY 1

Bostrycapulus heteropoma n. sp. and *Bostrycapulus tegulicius* (Gastropoda: Calyptraeidae) from Western Africa
RACHEL COLLIN AND EMILIO ROLÁN 8

A New Species of *Hypselodoris* and a Redescription of *Hypselodoris picta lajensis* (Nudibranchia: Chromodorididae) from Brazil
SIMONE DACOSTA, VINICIUS PADULA AND MICHAEL SCHRÖDL 15

Diet and Feeding Habits of *Octopus hubbsorum* Berry, 1953, in the Central Mexican Pacific
ERNESTO LÓPEZ-URIARTE, EDUARDO RÍOS-JARA AND MÓNICA ELIZABETH GONZÁLEZ-RODRÍGUEZ 26

Sacoglossan Opisthobranchs on Northwestern Pacific Shores: *Stiliger berghi* Baba, 1937, and *Elysia* sp. on Filamentous Red Algae
CYNTHIA D. TROWBRIDGE, YOSHIAKI J. HIRANO AND YAYOI M. HIRANO 43

A New Species of *Anatoma* (Vetigastropoda: Anatomidae) from a Hydrothermal Vent Field in Myojin Knoll Caldera, Izu-Ogasawara Arc, Japan
TAKENORI SASAKI, DANIEL L. GEIGER AND TAKASHI OKUTANI 63

Oligocene and Miocene Vesicomyid Bivalves from the Katalla District, Southern Alaska
STEFFEN KIEL AND KAZUTAKA AMANO 76

Trophonella (Gastropoda: Muricidae), a New Genus from Antarctic Waters, with the Description of a New Species
M. G. HARASEWYCH AND GUIDO PASTORINO 85

THE FESTIVUS

(U.S.A. – Californie)
Vol. 42, N°6, 2010

CONTENTS

Club news 64
California Butterclam, *Saxidomus nuttalli*, a northern range extension to Crescent City, California
WENDELL WOOD 65
Catalog of Recent and Fossil Cypraeidae and Eocypraeidae: 2005 through 2009
LINDSEY T. GROVES 66
Having fun at the Auction/Potluck, 2010
WES FARMER, individual photos, CAROLE HERTZ, montage 67

THE FESTIVUS

(U.S.A. – Californie)
Vol. 42, N°7, 2010

CONTENTS

Club news 76
Intraspecific variability of the shells of *Sinezona rimuloides* (Carpenter, 1865)
ELIZABETH A.R.GARFINKLE 77
Unusual location for *Latirus mediamericanus*
RICK NEGUS 82

THE FESTIVUS

(U.S.A. – Californie)
Vol. 42, N°8, 2010

CONTENTS

Club news ... 84
A new locality for *Vasum globulus* (Gastropoda, Turbinellidae, Vasinae): the island of Sint Eustatius, Leeward Islands, West Indies
SUSAN HEWITT ... 85
Report of the combined AMS/WSM meeting - 2010
JULES HERTZ ... 89
Additional records of the newly described *Muricopsis mcleani* from the Golfo de California
SHAWN WIEDRICK ... 92

THE NAUTILUS

(U.S.A.)
Vol. 124, N°2, mars 2010

Paul Valentich-Scott, **Carol Skoglund** — A review of the Recent Pandoridae (Bivalvia) in the Panamic Province, with descriptions of three new species ... 55

Jess W. Jones, **Richard J. Neves** — Descriptions of a new species and a new subspecies of freshwater mussels, *Epioblasma ahlstedti* and *Epioblasma florentina aureola* (Bivalvia: Unionidae), in the Tennessee River drainage, USA ... 77

Axel Alf, **Philippe Maestrati**, **Philippe Bouchet** — New species of *Bolma* (Gastropoda: Vetigastropoda: Turbinidae) from the tropical deep sea ... 93

B.L. Bodamer, **M.L. Ostrofsky** — The use of aquatic plants by populations of the zebra mussel (*Dreissena polymorpha*) (Bivalvia: Dreissenidae) in a small glacial lake ... 100

Claude Vilvens, **Javier Sellanes** — Description of *Calliostoma ceciliae* new species (Gastropoda: Chilodontidae: Calliotropinae) from off Chile ... 107

Roland Houart, **Robert Moffitt** — A new *Scabrotrophon* (Gastropoda: Muricidae) from Hawaii and discussion about the generic classification of *Boreotrophon kamchatkanus* Dall, 1902, a related species ... 112

HAASIANA

(Israël)
N°5, 2010

Contents

I. **Introduction** ... i
  From the Director ... ii
  From the Coordinator of the Natural History Collections ... iv

II. **The Hebrew University Natural History Collections Computerizing Project** 1
    In Memoriam: **Dr. Shoshana Ashkenazi** ... 4

III. **The Biological Collections** ... 11
  1. The Herpetological Collection (Section of Amphibians and Reptiles) ... 11
    a. History of the Collection ... 11
    b. The Report of the Section ... 15
    c. A List of Types in the Hebrew University Herpetology Collection and their References ... 23
  2. The Herbarium ... 35
  3 The Section of Palaeontology and Comparative Osteology, Mammals and Birds ... 42
    Report of the conservator ... 48
4. The Section of Aquatic Invertebrates, Arachnids and the Parasitological Collections ... 49
    In Memoriam: **Dr. Gershom Levy** ... 55
  5. The Section of Molluscs ... 63
  6. The Section of Fishes ... 80

IV. **Publications since 2008** ... 85

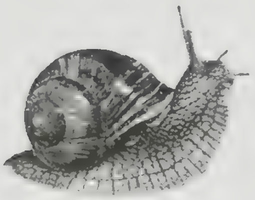
FERNAND & RIKA DE DONDER
Melsbroeksestraat 21
1800 Vilvoorde - Peutie
BELGIUM
Tel : +32 (0)2 253 99 54
Fax : +32 (0)2 252 37 15
e-mail : fernand.de.donder@pandora.be

WORLDWIDE SPECIMEN SHELLS

10 Minutes from Brussels Airport. Visitors welcome.

All Families from the very common to the ultra rare, specialized in Pectinidae, Philippine shells and European shells.

Free list on request, good quality shells at the best prices. Satisfaction guaranteed !

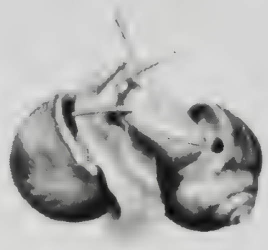


XENOPHORA
Bulletin de l'Association Française de Conchyliologie

2010 Yearly subscription rate
France –Europe – DOM TOM : 50 €
Other countries : 60 €
Visit our site : www.xenophora.org

afc BP 307 F-75770 Paris Cedex 16

UN GANGSTEROPODE



SOCIEDAD ESPAÑOLA DE MALACOLOGIA
S.E.M.

Museo Nacional de Ciencias Naturales
José Gutiérrez Abascal, 2
28006 MADRID

SEM (Sociedad Española de Malacologia) is a scientic society devoted to the study of molluscs.

Every year the memberships receive the following publications:

2 issues of IBERUS
1 issue of RESEÑAS MALACOLOGICAS
2-3 issues of NOTICIARIO DE LA SEM

some years, 1 extra IBERUS from a Congress or as a supplement.

You can be membership of the SEM by 7.000 ptas by year, plus an unique inscription fee of 1.000 ptas.

Please, ask for the inscription print paper.

The Strandloper
BULLETIN OF THE CONCHOLOGICAL SOCIETY OF SOUTHERN AFRICA

The quarterly bulletin of the Conchological Society of Southern Africa contains reviews and discussion of Southern African marine and non-marine shells, and information about shell collecting in the region. Membership of the Society is US$25 per year.

Please contact
The Conchological Society of S.A.
7 Jan Booysen Str.
Annlin 0182 Pretoria
South Africa
or
email **mikec@msinfo.mintek.ac.za**

Nederlandse
Malacologische
Vereniging

Dutch
Malacological
Society

Our society warmly welcomes new members (both from the Netherlands and abroad) to participate in our activities:

- **the journals (Basteria and Correspondentieblad)**
- **the meetings (usually 3-4 per year)**
- **the Internet website**
- **the library**
- **the collecting excursions**

Join us and meet new shelling friends. Further info: Bram Breure, Van Schagenplantsoen 8, NL-2741 EN Waddinxveen, The Netherlands. E-mail: abreure@xs4all.nl

Club Conchylia e.V.
German Shell Collector's Club

Our journals:

Informationen
Mitteilungen
Acta Conchyliorum

Yearly subscription rate: 40.- €

Visit our site:

www.club-conchylia.de

Further informations:

Klaus Kittel
Sonnenrain 10
D-97859 Wiesthal
e-mail: klaus_kittel@hotmail.com

GLORIA MARIS

A magazine dedicated to the study of shells.

Edited by the Belgian Society for Conchology, organizers of the Belgium Shellshow

Subscription: Belgium: € 30 - The Netherlands: € 33
Other countries: € 40

Members account manager: J. Wuyts Koningsarendlaan 82 B 2100 Belgium
tel.: 32 3 324 99 14 e-mail: wuyts.jean@ scarlet.be

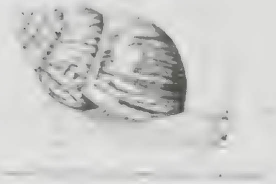
TRITON

Journal of the Israel Malacological Society

ISSN 1565-1916
Published twice a year since 2000
Yearly subscription rate 20 €

Further information:
Eduard Heiman
e-mail: heimel@netvision.net.il

Keppel Bay Tidings
A quarterly magazine dedicated to the study of shells.
Edited by the Keppel Bay Shell Club Inc.
Subscription:- $20.00 Aus.
Apply to:- Keppel Bay Shell Club Inc.
P.O. Box 5166
Central Queensland Mail Centre, 4702
Queensland,Australia.



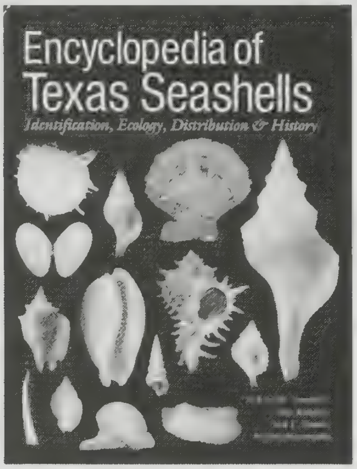
CONCHOLOGIST

Calendar membership (Jan - Dec) = $25 (USA)
Postal surcharges: + $5 for USA first class,
Canada & Mexico + $5, other nations + $15
New members apply to Doris Underwood, Membership Director
698 Sheridan Woods Drive
W. Melbourne, FL 32904-3302
USA
dunderwood1@cfl.rr.com

Quarterly Journal of the Conchologists of America, Inc.

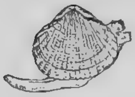
ENCYCLOPEDIA OF
TEXAS SEASHELLS

par **John W. Tunnell Jr., Jean Andrewws, Noe C. Barrera & Fabio Moretzsohn**



- pp. 1-512, toutes les illustrations en couleur et photographies couleurs - en anglais.
- Format 220 x 285 mm, couverture rigide.
- Prix : 50.00 dollars + frais d'envoi
- Texas A§M University Press.
- ISBN-13 : 978-1-60344-141-4
- ISBN-10 : 1-60344-141-7
- www.tamupress.com

Si vous passez commande chez l'un de nos annonceurs, n'oubliez pas de préciser que vous avez trouvé son annonce dans Novapex/Société !!!



Grandes marées de l'année 2011

Christiane DELONGUEVILLE et Roland SCAILLET

2011 est une grande année. En effet, le 21 mars nous avons une marée d'un coefficient de 118 et d'autres avec un coefficient de 114 et 115. Rappelons que la marée du siècle (coefficient 119) aura lieu en 2015 ! Nous sommes donc dans une décennie faste, ne boudons pas notre plaisir.

Coefficients (> 100) des pleines mers à Brest

(Les marées basses correspondantes sont donc particulièrement intéressantes à prospecter.)

Janvier	Vendredi 21	101 - 103
	Samedi 22	105 - 105
	Dimanche 23	103 - 100

Février	Vendredi 18	100 - 106
	Samedi 19	111 - 114
	Dimanche 20	115 - 115
	Lundi 21	113 - 109
	Mardi 22	104 - (97)

Mars	Samedi 19	104 - 110
	Dimanche 20	114 - 117
	Lundi 21	118 - 117
	Mardi 22	114 - 109
	Mercredi 23	103 - (95)

Avril	Dimanche 17	101 - 106
	Lundi 18	110 - 112
	Mardi 19	112 - 110
	Mercredi 20	107 - 103

Mai	Mardi 17	(99) - 100
	Mercredi 18	101 - 100

Juin	-	-

Juillet	-	-

Août	Lundi 1	(99) - 101
	Mardi 2	102 - 103
	Mercredi 3	101- (98)
	Lundi 29	(99) – 104
	Mardi 30	108 - 111
	Mercredi 31	112 - 111

Septembre	Jeudi 1	108 - 105
	Mardi 27	104 - 109
	Mercredi 28	112 - 114
	Jeudi 29	115 - 113
	Vendredi 30	110 - 105

Octobre	Mercredi 26	102 - 106
	Jeudi 27	109 - 111
	Vendredi 28	111 - 109
	Samedi 29	105 - 101

Novembre	Vendredi 25	100 - 102
	Samedi 26	102 - 102
	Dimanche 27	100 - (97)

Décembre	-	-

Conseils pour une marée réussie et soucieuse de l'environnement :

Remettez toujours les pierres déplacées en bon ordre. Observez, photographiez et n'échantillonnez que le strict nécessaire. Soyez prudents et renseignez-vous sur les heures des marées à l'endroit où vous vous trouvez. Bonnes marées

REFERENCE :

Annuaire des Marées pour l'année 2011 - Ports de France - Métropole - Tome 1 - SHOM (Service Hydrographique et Océanographique de la Marine) *- Paris - 257 p.*

Plage de Kerhostin - Presqu'île de Quiberon (Morbihan)

Les données reprises dans cet article peuvent également se retrouver sur notre site Internet :

http://www.societe-belge-de-malacologie.be

SOCIETE BELGE DE MALACOLOGIE
(BELGIAN MALACOLOGICAL SOCIETY)
Association Sans But Lucratif
Siège Social: **Rue de Hermalle, 113, B-4680 Oupeye, Belgium**

SATION - LIDGELD - MEMBERSHIP FEE - COTISATION - LIDGELD - MEMBERSHIP FEE - COT

- Pensez à renouveler votre cotisation pour 2011. Merci de votre collaboration.
- Denk eraan uw lidgeld voor 2011 te regelen. Hartelijk dank voor uw medewerking.
- Please don't forget your membership fee for 2011. Thanks for your collaboration.

BELGIQUE - BELGIË - BELGIUM

Membre ordinaire (gewoon lid): 40,00 €

Versement à effectuer auprès de la Banque de la Poste, au n° 000-0974225-54 de M. Marc ALEXANDRE, rue de la Libération, 45, 6182 SOUVRET

ETRANGER - BUITENLANDS - FOREIGN

Abonnement
Subscription

55.00 €

Versement à effectuer auprès de la Banque de la Poste Belge, Bruxelles, au n° 000-0974225-54 [IBAN : BE42000097422554 - BIC : (= SWIFT) BPOTBEB1] de M. Marc ALEXANDRE, rue de la Libération, 45, 6182 SOUVRET, **ou** par mandat poste international à la même adresse (tous frais y afférents à payer lors de l'acquittement). Chèques personnels : ajouter 20 € pour frais bancaires

Nos amis français peuvent également payer au n° 041145370778 47 (banque d'épargne française) au nom de M. Marc Alexandre.
Nous n'acceptons pas les chèques personnels (non encaissables en Belgique)

Payable at Banque de la Poste Belge, Brussels, account nr 000-0974225-54 [IBAN: BE42000097422554, BIC: (= SWIFT) BPOTBEB1] of M. Marc ALEXANDRE, rue de la Libération, 45, 6182 SOUVRET, Belgium, **or** by International Money Order at same address. Payable **IN EURO ONLY**. (All bankcharges to be paid by customer)

VOUS POUVEZ EGALEMENT UTILISER LES SERVICES DE PAYPAL. CONTACTEZ D'ABORD **roland.houart@skynet.be**
YOU CAN ALSO USE PAYPAL. PLEASE CONTACT BEFORE **roland.houart@skynet.be**

MOLL.
NOV
5527

NOVAPEX

MCZ
LIBRARY
NOV [illegible]
HARVARD
UNIVERSITY

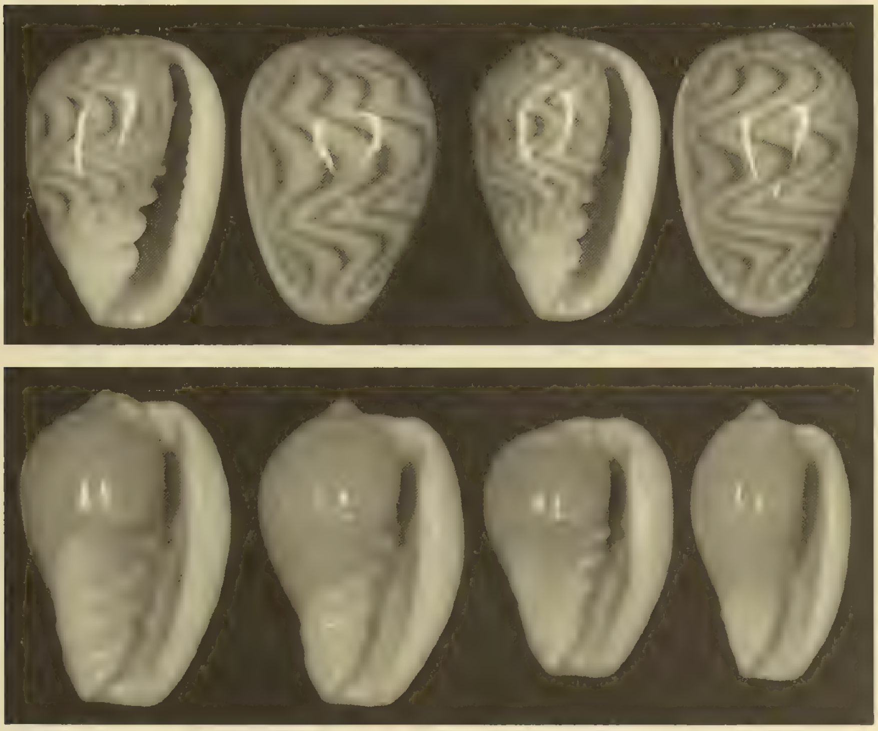
Trimestriel de la Société Belge de Malacologie
association sans but lucratif
Quarterly of the Belgian Malacological Society

HORS SERIE N°7 2010 10 OCTOBRE

SOMMAIRE

A Revision of the genus *Cryptospira* Hinds, 1844 (Caenogastropoda: Marginellidae)

Andrew WAKEFIELD



ISSN 1375-7474

Périodique trimestriel
Bureau de dépôt
1370 Jodoigne

RÉGION WALLONNE

Publié avec l'aide du Ministère de la Région Wallonne

COTISATIONS / MEMBERSHIP 2010

Membres résidant en Belgique
(NOVAPEX et les numéros hors série)
Membre effectif .... **40 €**

(sans le service du bulletin)
Personne appartenant à la famille d'un membre effectif et ayant même résidence .... 15 €

Versement à effectuer à la Banque de la Poste, au n° 000-0974225-54 de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret.

Abonnés résidant à l'étranger
(NOVAPEX et les numéros hors série)
Cotisation .... **55 €**

Versement à effectuer auprès de la Banque de la Poste Belge, Bruxelles, au n° 000-0974225-54 [IBAN : BE42000097422554 - BIC : (= SWIFT) BPOTBEB1] de M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret **ou** en versant **58 euros par Paypal** (contacter roland.houart@skynet.be auparavant) **ou** par mandat poste international, **EN EURO UNIQUEMENT**, au nom de M. Marc Alexandre, rue de la Libération, 45, B-6182 Souvret
(tous frais y afférents à payer lors de l'acquittement)

FOREIGN SUBSCRIBERS

(NOVAPEX and irregularly published supplements)
Single subscription .... **55 €**

Payable at Banque de la Poste Belge, Brussels, account nr 000-0974225-54, [IBAN: BE42000097422554, BIC: (= SWIFT) BPOTBEB1] of M. Marc Alexandre, rue de la Libération, 45, 6182 Souvret, Belgium, **or** by International Money Order at same address **or 58 euros** with **Paypal** (contact roland.houart@skynet.be before). Payable **IN EURO ONLY**. (All bankcharges to be paid by customer)

Suivant un accord avec la **SIM** (Societa Italiana di Malacologia), nos membres **européens** qui souscrivent egalement à cette société pour 2010, peuvent payer leur(s) cotisation(s) **à la SBM** pour les deux sociétés. Les membres européens de la **SIM** peuvent faire de même chez eux.
*By common agreement with **SIM**, our **European** members that subscribe to that society for 2010 can pay **to the SBM** the membership fees for both societies. The European members of the **SIM** can do the same paying to their society.*

Dans ce cas, vous obtiendrez une réduction de 2 € pour la SIM et de 2 € pour la SBM, soit :
In this way you can have a discount of 2 € for the SIM and of 2 € for the SBM :

SIM (Bol. Malacologico + Notiziario SIM) €38,00	SBM (Novapex + Novapex/Société) .... €53,00 (Belgian members: €38,00)

Editeur responsable: C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye

PRESIDENT HONORAIRE (*Honorary President*)	• M. R. DUCHAMPS, av. Mozart, 52, 1190 Bruxelles
VICE-PRESIDENT HONORAIRE (*Honorary Vice-President*)	• M. E. WAIENGNIER, rue Camille Wollès, 42, 1030 Bruxelles

CONSEIL D'ADMINISTRATION

PRESIDENT	• M. C. VILVENS, rue de Hermalle, 113, 4680 Oupeye 04/248.32.25
VICE- PRESIDENT & BIBLIOTHECAIRE (*Vice-president and Librarian*)	• M. E. MEULEMAN, Sart 32, 4171 Poulseur 04/380 55 16
TRESORIER (*Treasurer*)	• M. M. ALEXANDRE, rue de la Libération, 45, 6182 Souvret 071/46.12.88
SECRETAIRE (*Secretary*)	• Mme A. LANGLEIT, av. Cicéron, 27, bte 92, 1140 Bruxelles 02/726.17.61
ADMINISTRATEUR (*NOVAPEX Manager*)	• M. R. HOUART, St. Jobsstraat, 8, 3400 Landen (Ezemaal) 016/78.86.16

Internet : http://www.societe-belge-de-malacologie.be
e-mail : vilvens.claude@skynet.be **ou** e.meuleman@skynet.be

Les articles et textes présentés dans cette revue réflètent l'opinion personnelle de leur(s) auteur(s) et non pas nécessairement celle de la Société ou de l'éditeur responsable.
Tous droits de reproduction, de traduction et d'adaptation des articles publiés dans ce bulletin, réservés pour tous pays.
All rights of reproduction are reserved with the written permission of the board.

PUBLICATIONS PRECEDENTES/ FORMER PUBLICATIONS:
- Bulletin Mensuel d'Information (1966-1971)
- INFORMATIONS de la Société Belge de Malacologie (1972-1985)
- ARION (1986-1999)
- APEX (1986-1999)

SOCIETE BELGE DE MALACOLOGIE

A. WAKEFIELD NOVAPEX 11(HS 7): 1-55, 10 octobre 2010

A Revision of the genus *Cryptospira* Hinds, 1844 (Caenogastropoda: Marginellidae)

MCZ
LIBRARY
NOV 15 2011
HARVARD
UNIVERSITY

Andrew WAKEFIELD
14 Forest Side, Buckhurst Hill, Essex, IG9 5SL, U.K.
e-mail: bmw.awake@btinternet.com

KEY WORDS. Marginellidae, *Marginella*, *Cryptospira*, species groups, new species, type specimens, taxonomy, biogeography, evolution, Pliocene and Pleistocene fossils, Sunda Shelf, Wallace line, South China Sea, Java Sea, Andaman Sea.

ABSTRACT. The marginellid genus *Cryptospira* Hinds, 1844 is revised on the basis of characteristic shell morphologies. Three species groups within the genus are proposed; the *Cryptospira tricincta* group, the *Cryptospira ventricosa* group and the *Cryptospira elegans* group. The recent species and the fossil species are presented and discussed separately.

In the first section, all of the taxa in the *Cryptospira tricincta* group are revised and updated. Of the nine published taxa, six (*Marginella tricincta* Hinds, 1844; *M. onychina* A. Adams & Reeve, 1848; *C. quadrilineata* Gaskoin, 1849; *M. immersa* Reeve, 1865; *M. fischeri* Bavay, 1902; *C. sabelli* Cossignani, 2006) are considered to be valid species, and three are considered to be synonyms (*M. ovalis* Marrat, 1881 and *C. quiquandoni* Cossignani, 2006 are junior synonyms of *M. tricincta* Hinds, 1844, and *M. quadrilineata* Reeve, 1864 is a junior synonym of *C. quadrilineata* Gaskoin, 1849). From an argument based upon regional differences in shell morphology, the phenotypes currently accepted as *C. tricincta* are assumed to be a complex of species and/or subspecies. Further division of the *C. tricincta* group into three sub-groups is also proposed on the basis of morphologic features, and three new species are described: *C. wallacei* n. sp. from the Makassar Strait, Eastern Kalimantan, *C. cloveriana* n. sp. from Taiwan to Singapore, and *C. mccleeryi* n. sp. from the Gulf of Thailand.

The *Cryptospira ventricosa* group comprises six published taxa, three of which are valid species, namely *M. ventricosa* G. Fischer von Waldheim, 1807, *M. dactylus* Lamarck, 1822 and *M. trailii* Reeve, 1865. Three further taxa are considered to be junior synonyms of *M. ventricosa* (*M. quinqueplicata* Lamarck, 1822; *M. vermiculata* Redfield, 1851; *M. hainesii* Petit, 1851) and one dubious name, *Voluta porcellana* Perry, 1811 is also discussed.

The *Cryptospira elegans* group comprises thirteen published taxa of which seven are considered valid species; *Voluta elegans* Gmelin, 1791; *V. strigata* Dillwyn, 1817 (synonym *M. undulata* Deshayes, 1844, with *M. Bernardii* Largilliert, 1845 introduced as a new synonym); *C. marchii* Jousseaume, 1875 (removed from the synonymy of *V. strigata* Dillwyn, 1817 and elevated to valid species status. *M. Burchardi* Reeve, 1864 is transferred from the synonymy of *V. strigata* Dillwyn, 1817 to the synonymy of *C. marchii*); *M. praecallosa* Higgins, 1876 (previously considered by authors to be a synonym of *V. strigata* Dillwyn, 1817, with *M. loebbeckeana* Weinkauff, 1878 introduced as a new synonym); *C. glauca* Jousseaume, 1875; *Persicula grisea* Jousseaume, 1875 (senior synonym *M. obtusa* Sowerby, 1870 and junior synonym *M. sexplicata* Weinkauff, 1879); and *M. scripta* Hinds, 1844.

The holotype of *M. loebbeckeana* Weinkauff, 1878 is rediscovered, and this taxon is considered not to be a variety of *C. glauca* Jousseaume, 1875 as commonly accepted, but rather a junior synonym of the valid *M. praecallosa* Higgins, 1876, here considered as a valid species. *C. bridgettae* n. sp. from the Andaman Sea is described as a new species in the *Cryptospira elegans* group.

Three taxa occurring exclusively as fossils from the Indonesian Pleistocene have been published (*C. sangiranensis* Martin, 1906; *C. dactylus var. inflata* Martin 1895; *M. birmanica* Vredenburg, 1923), and all are considered to be extinct. Eight further fossil phena comprising three forms of *M. tricincta* Hinds, 1844 (one a synonym named *C. quinqueplicata var. minor* Martin, 1931), *M. ventricosa* Fischer von Waldheim, 1807, *M. dactylus* Lamarck, 1822 (synonym *M. dactylus var. minor* Pannekoek, 1936), *V. elegans* Gmelin, 1791 (synonym *M. (C.) ex aff. elegans* Oostinghe, 1938), *V. strigata* Dillwyn, 1917 (synonym *M. (C.) aff. loebbeckeana* Oostinghe, 1938) and *M. trailii* Reeve, 1865 are considered to match recent species. Two new fossil species of *Cryptospira* from the late Pliocene of Sangiran, central Java, are described; *C. bundharmai* n. sp. from Sambang Macan, and *C. kemukusi* n. sp. from Kemukus. Both are considered to be extinct.

In examining the phylogenic relationships of the genus, evidence from the fossil record and comparative analysis of the radula of recent species point towards a relatively recent evolution of the genus as an adaptive radiation from the main *Prunum / Volvarina* stock into the region of the Sunda Shelf, probably during the last 3-5 million years. The current biogeographic distribution of the genus is examined and three species group radiations from a central evolutionary zone, where species diversity is at its greatest are proposed.

INTRODUCTION

The compact and very distinctive Asian marginellid genus *Cryptospira* is arguably the most widely recognised and collected of this large family of carnivorous gastropods. This is largely due to the above average shell size, attractive patterns and colours, and ready availability of specimens. It has a turbulent taxonomic history which plays host to far too many synonyms and dubious names on account of high variability and an apparently confusing array of superficially similar morphologies. Even the name of the genus is confusing as the majority of its species do not have concealed spires. Several papers, limited in their scope, have made the principal contributions to our knowledge to date (Coomans, 1969; Clover, 1979 & 1981; Dharma & Dunlap, 1994), but the genus has never been the subject of a general revision, despite being distinct and confined to a well-defined geographical area. There is a low number of recognized species probably because the absence of clear specific distinction in the literature causes great difficulty in sorting out the distinct species from morphological varieties. A lack of scientifically organized prospecting in the field and the difficulty in obtaining reliable data with specimen lots when they are collected also contributes to the uncertainty, with the result that a historic tendency to lump species together has lingered on to the present day. This has occurred most noticeably in the type species *Cryptospira tricincta* Hinds, 1844 which has been used as the default name for several closely related but in fact different species. Not surprisingly, therefore, there is general confusion about the identity of many specimens and they are often labelled inappropriately with their names simply guessed at. A comprehensive revision of the genus and its constituent taxa is therefore well overdue.

Genus Taxonomy

The genus received extensive coverage in the 19th Century monographs, catalogues and iconographies of Lamarck (1822), Reeve (1864-65), Sowerby (1870), Redfield (1870), Jousseaume (1875) and Weinkauff (1879), wherein lie many of the original descriptions. However, in the absence of a suitably established generic arrangement, the species featuring in these monographs and catalogues were often listed under the all-encompassing family name *Marginella*. Hinds (1844a) reviewed *Marginella*, splitting it into two sections; *Cryptospira* for species with hidden spires, and *Phaenospira* for species with exposed spires. Hinds' usage of division here is valid as a generic level name according to the International code of Zoological Nomenclature (Article 10e). Subsequent reviewers oscillated between generic division, and the use of the family name alone. *Cryptospira* was one of fourteen genera adopted by Jousseaume (1875) although not all of the species we now consider to be *Cryptospira* made it into his definition of the genus. For example, he placed *C. grisea* (Jousseaume, 1875) in *Persicula*, and *C. scripta* (Hinds, 1844) and others in *Egouena*, a new genus he created for many species we now consider to be in the *Prunum / Volvarina* complex, and a generic name not currently in popular use. Tomlin (1917) separately listed the genera without attempting to use them in his list of species. In his proposed reclassification of the family Marginellidae, Coan (1965) listed *Cryptospira* (along with the genus *Closia* Gray, 1857) as a subgenus of *Bullata* Jousseaume, 1875. *Bullata* is a genus restricted to the western Atlantic (northeast South America) and with *Closia* and *Cryptospira* having restricted ranges and evolutionary origins in the north-western Indian Ocean and south-east Asia respectively, a close link to *Bullata* seems unlikely. Coan's classification has been superseded by that of Coovert & Coovert (1995) and is now rarely used.

So what are the main morphologic criteria enabling separation of *Cryptospira* from other genera in the *Prunum / Volvarina* complex? Coovert & Coovert (1995) separated it from the *Volvarina* and *Prunum* phyletic lineages on the basis of the extra columellar plications (from the four in *Prunum / Volvarina*, up to six plications plus a parietal denticle in *Cryptospira*) which they considered to be a major specialization. However the increased plication count is not in itself diagnostic; one *Prunum* group (*Prunum fulminatum* and associated species which will be mentioned later) has five, and the the *Serrata* lineage also has a fifth plication, albeit a discontinuous one, apparent in the aperture. Therefore some other homogenous character needs to be identified to define the genus.

In the *Prunum / Volvarina* complex generally, and including *Cryptospira*, there is no resorption of internal whorls and the plications spiral up the columella gradually reducing in size but otherwise remaining unmodified (Fig. 1a). Further heterogenous characters are general shell shape and size, spire elevation, presence of a thick labial margin, parietal callus deposits and labial denticulation. The only homogenous shell characters for the genus *Cryptospira* are the unique morphology of the columella plications, their angle of orientation on the columella, and the percentage of apertural length they occupy. The plications in *Cryptospira* occupy from over ½ to almost the whole of the aperture if the remote 6th plication or lira is included, and their orientation becomes progressively more horizontal. This is demonstrated in the cutaway sections of *C. elegans* (Fig. 1b), *C. tricincta* (Fig. 1c), and *C. ventricosa* (Fig. 1d). Even the 6th plication, thinner and finer than the preceeding ones is continuous all the way up the columella (Fi. 1e). In comparison, the 4 or 5 plications of *Prunum / Volvarina* only occupy up to half of the apertural length and their orientation remains relatively oblique (e.g. *Prunum pergrandis* Clover, 1974, Fig. 1h). In *Closia*, the four thin, sharp plications are even more uniform and concentrated at the anterior third of the aperture (e.g. *Closia giadae* Cossignani, 2001, Fig. 1i). In *Serrata* the plications occupy less than half of the aperture and if a fifth plication is present it becomes discontinuous within the aperture after only half a revolution, unlike the comparable continuous 6th plication in *Cryptospira*.

Alhough the first two plications are similar to those encountered in the *Prunum / Volvarina* complex, the third, fourth and fifth plications, especially in the *Cryptospira elegans* and *Cryptospira tricincta* groups, have square topped plications in cross - section (Fig. 1g). These are strongly emergent from the aperture, and in some species cross almost the entire ventral surface. These plications are wider at the crest, and bear a double beading along it, resulting in an apparent bifurcation at the distal terminus of each plication (Fig. 1f). The thin and remote sixth plication, where present, often terminates further out of the aperture than earlier ones, and forms a distincly 'club – shaped' distal end which often points posteriorly.

The presence of the three divergent *Cryptospira* groups comprising species which share common ancestral lineages is revealed from further morphologic trends and geographic distribution patterns. It is the exploration of these species groups, presented herein for the first time, which forms the main thrust of this paper.

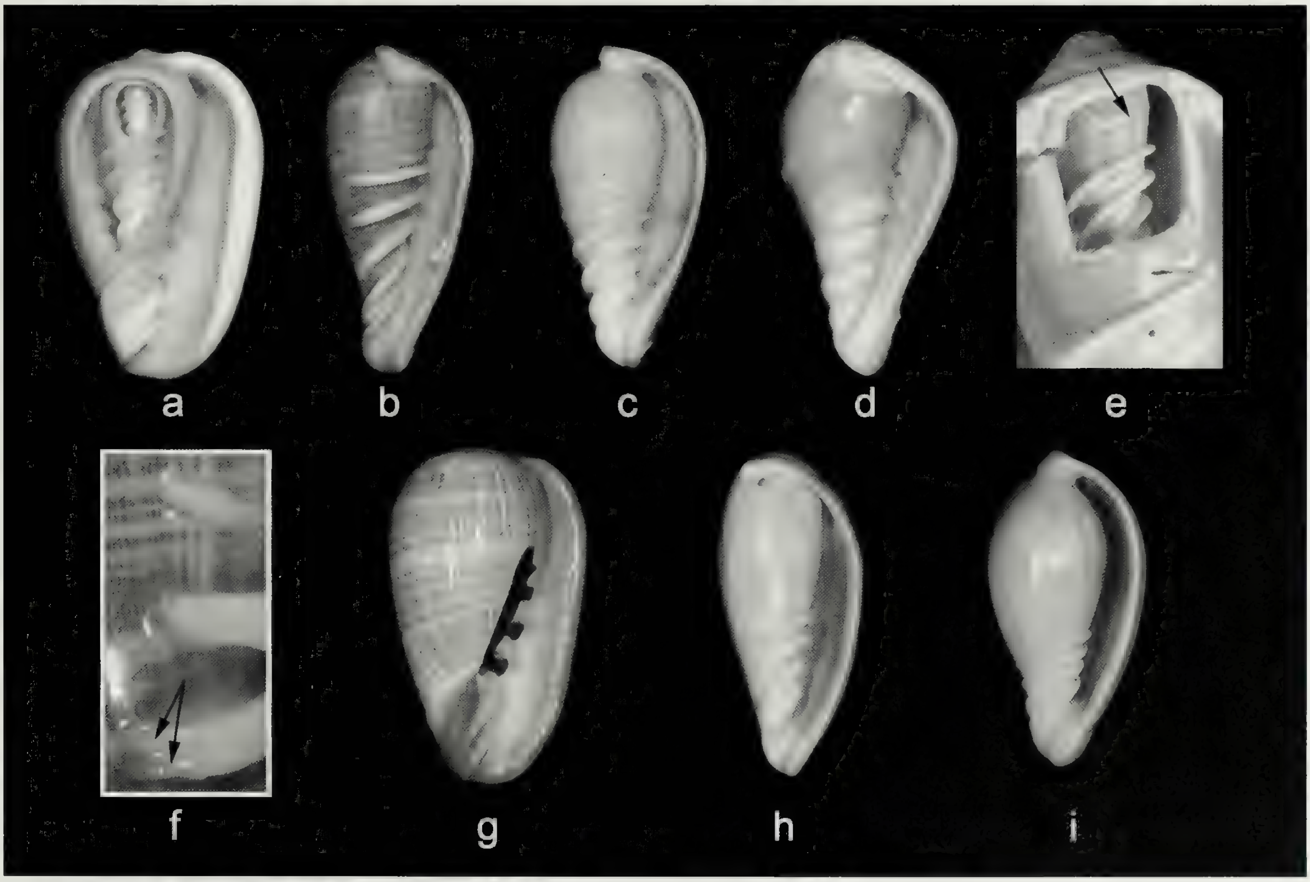


Figure 1. Shell sections revealing Columella morphologies of *Cryptospira* and related genera.
a. Unmodified internal whorls and plications in *C. marchii.*; **b.** ½ adult whorl section of *C. elegans*; **c.** ½ adult whorl section of *C. tricincta*; **d.** ½ adult whorl section of *C. ventricosa*; **e.** Continuous 6th plication in early whorl of *C. ventricosa*; **f.** Terminal bifurcation of plications of *C. elegans*; **g.** Cross section of plications 3 - 5 and parietal lira in *C. elegans*; **h.** ½ adult whorl section of *Prunum pergrandis* Clover, 1974; **i.** ½ adult whorl section of *Closia giadae* Cossignani, 2001

Specific Taxonomy

Until recently, the majority of the described species were known only from their type material, which was often confined to single specimens discovered on the major 19th Century collecting expeditions to the Far East. Consequently there are a number of old, poorly known taxa lying dormant in the literature, their names having fallen out of popular use because further specimens were unavailable. This was, and continues to be, mainly a reflection of the fact that the entire invertebrate fauna (including the Mollusca) of the whole region is very poorly prospected, with no concerted effort made to record and accumulate accurate locality and other data. However, the recent discovery and naming of several new species (see fig. 2) is both a reflection of the fact that there has been an increase in the prospecting for specimens for study, many of which come with more reliable data, and also due to a more analytical approach to their taxonomy. What is clear is that this apparently small genus is naturally more diverse than was first thought, with probably even more new species to be discovered in the future.

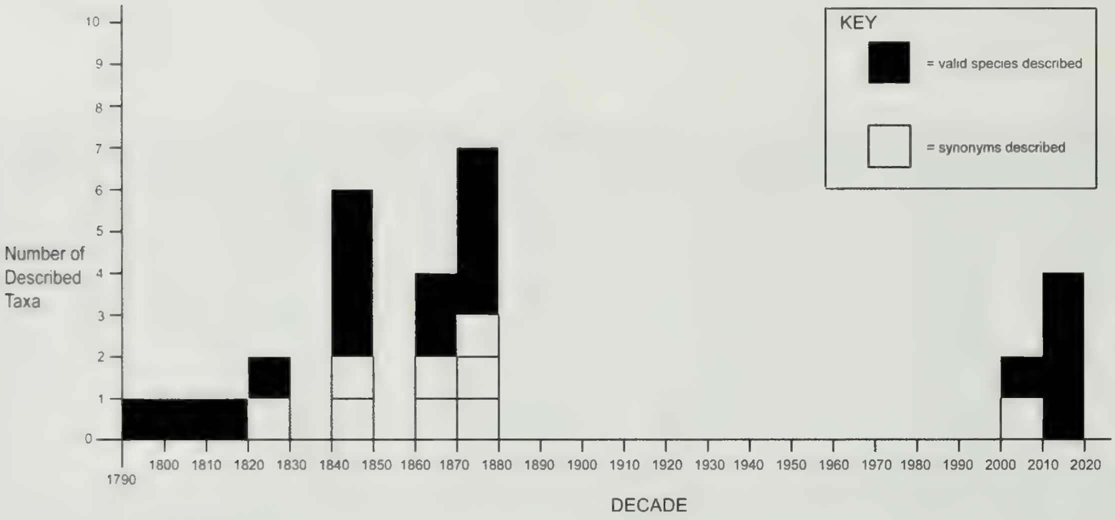


Figure 2. Bar chart indicating the number of *Cryptospira* taxa described, decade by decade, since 1790.

Apart from a few extracted radulae, patchy anatomical descriptions, and a few photographs and drawings, we know little about the living animals of *Cryptospira*, and population studies and DNA analyses are non-existent. So, through necessity, our species definitions are limited to morphologic studies of their shells. Throughout the current paper therefore I will be naming and describing morphospecies and will be assuming, rightly or wrongly, that these translate to biological species.

Natural Diversity

The genus is at its most diverse in the warm, shallow waters of the continental shelf (Sunda Shelf) region of Indonesia, where it completely dominates the large marginellid fauna (Fig. 5). The greatest concentration of species occur in the Java Sea off Java, Sumatra and Kalimantan (Borneo) and along the South China Sea-facing coast of Kalimantan and including the Straits of Malacca, the Karimata Strait, the Sunda Strait and the Makassar Strait (12 species). This continues northeast into Palawan (5 species) and the Sulu Sea up to the western central Philippine Islands (1 species) and on to southwestern Taiwan (2 species). The genus has also dispersed west to the Nicobar and Andaman Islands (2 species). Continental distribution extends westwards from Peninsular Malaysia (3 species) along the coasts of Thailand (6 species) and Myanmar (Burma) (2 species), to eastern India and Sri Lanka (1 species). From peninsular Malaysia it extends into the Gulf of Thailand (3 species) along the coasts of Cambodia and Vietnam (2 species) and the entire length of the Chinese coastline (3 species) up to the Taiwan Strait.

Incorrect generic assignments

Marginella mabellae Melvill & Standen, 1901 from Sri Lanka, and *M. angustata* Sowerby, 1846, two west-central Indian Ocean species often regarded as being *Cryptospira* in modern texts, do not belong in the genus. They have been confused with *Cryptospira* because their spires are covered by an apical callus extending from the posterior end of the lip and parietal surface. Adult shells of *M. mabellae* have an extensive opaque white parietal callus covering all of the ventral surface and columella, an external varix which is very wide anteriorly, a strongly inflexed lip and four very short stocky plications. Its morphology has more in common with that of northeast African and western Atlantic *Prunum* species such as *Prunum oblonga* (Swainson, 1829). *M. angustata* on the other hand, has a very wide labial varix which is only weakly externally thickened and completely lacks a varix groove. It too has a strongly inflexed lip and four oblique anteriorly situated plications. These typically *Volvarina*-like characters immediately rule out any direct association with *Cryptospira*. Furthermore, the distribution of these two non-labially denticulate species on the extreme western end of the range of the extremely dissimilar, labially denticulate *Cryptospira elegans* group species, provides biogeographic evidence that they are to be distinguished from *Cryptospira*.

Morphological species groups

Coovert & Cooovert (1995) took their reclassification to genus level. Yet it is obvious, when one views specimens of *Cryptospira* species in any quantity, that certain species bear morphological affinities with each other, and that the genus should be able to support a further taxonomic tier based upon natural groupings with shared characteristics. Such subdivision has in fact already been intimated by Gary Coovert (p. 93, 1995) who noted that 'One species group within the genus has distinctively gray-coloured shells'. It is difficult to know to which species he was referring, and as far as I am aware he did not publish his ideas further.

When the morphological characters of all of the species in the genus are assessed, it becomes apparent that three distinct diverging lineages branch off from the evolutionary *Cryptospira* 'tree'. They are introduced and defined herein as the *Cryptospira tricincta* group, the *Cryptospira ventricosa* group and the *Cryptospira elegans* group. The *Cryptospira tricincta* group can be divided further into three sub-groups. The differences between these groups and sub-groups are summarised in figure 3. It can be seen that analysis of a set of four primary shell characters shown in light grey (the angulation of the anterior canal, the shape of the anterior end, the number of plications with which callus is associated, and the total number of plications) will permit placement of the species in its correct group.

The angle that the siphonal canal makes with the long (columella) axis of the shell when viewed laterally, is a new and exceedingly important character that has not been previously utilised as a diagnostic tool. It is to be differentiated from, though it is associated with, truncation of the posterior end of the lip which is a character best observed from the ventral aspect of the shell.

Perhaps surprisingly for a genus whose name means 'hidden spire', this character does not actually define the genus. In fact, of the 20 valid species in the genus (including the new species described herein), only 5 have submerged spires. Neither is this character useful in the assignment of a species to one of the three groups. For example, the gracefully curving posterior end to the lip of *C. dactylus* and its submerged spire might suggest that the species was closely related to *C. tricincta* which also has a submerged spire and a similarly shaped posterior end to the lip. In fact the columella morphology and the profile of the anterior end of *C. dactylus* are quite diagnostic, outweigh the secondary character of the spire morphology, and positively place the species in the *Cryptospira ventricosa* group. Along with morphology of the lip and columella plications, the spire morphology is only of use in the assignment to sub-groups of the *Cryptospira tricincta* group species.

Other characters such as colour are also useful, but generally more so for identification of individual species. For example, the shells of *C. cloveriana*, *C. ventricosa*, and *C. glauca* are all of a similar, even grey colour, yet all three species are in fact in different morphological groups. As in other families, pattern styles (when present) tend to be much more reliable taxonomic indicators than the colours themselves.

Such morphological grouping has another, very valuable taxonomic function in that it is a useful aid in the separation and subsequent identification of some species which are often confused with one another, such as *C. glauca* and *C.ventricosa* (see p. 26). A good understanding of the morphological characters of the three *Cryptospira* groups can therefore make a significant contribution to nomenclatural stability.

It is likely that anatomical characteristics of the animal and its chromatism are also group specific characters but this remains to be confirmed.

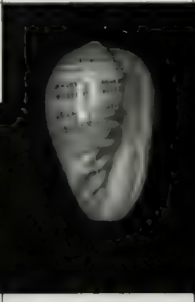
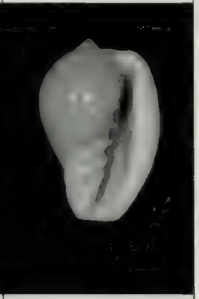
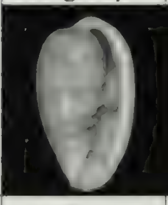
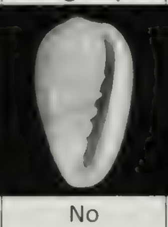
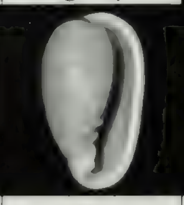
Shell Character		*Cryptospira tricincta* Group			*Cryptospira elegans* Group	*Cryptospira ventricosa* Group
		'*Cryptospira tricincta* sub-group'	'*Cryptospira fischeri* sub-group'	'*Cryptospira quadrilineata* sub-group'		
						
Angulation of anterior canal From lateral viewpoint	In line with columella axis	No	No	No	No	Yes
	Angled downwards by 30°	Yes	Yes	Yes	Yes	No
Shape of anterior end	Smoothly rounded	Yes	Yes	Yes	Yes	No
	Truncated	No	No	No	No	Yes
Extent of callus formation at distal ends of plications	From 1st to 3rd plication	Yes	Yes	Yes	No	No
	From 1st to between 3rd and 4th plication	No	No	No	Yes	No
	From 1st to 4th plication	No	No	No	No	Yes
Number of plications (not incl. denticles)	4	No	No	Yes	No	No
	5	No	No	No	Yes	Yes
	6	Yes	Yes	No	Yes	No
Labial Morphology	Denticles Present	No	No	No	Yes	No
	Denticles Absent	Yes	Yes	Yes	Yes	Yes
	Relatively curved	Yes	No	Yes	No	No
	Relatively straight	No	Yes	No	Yes	Yes
Spire morphology	immersed and callused	Yes	No	Yes	Yes	Yes
	Exposed/elevated	No	Yes	No	Yes	Yes
Morphology of plications	Strongly cross ventral surface	Yes	No	No	Yes	Yes
	Weakly cross ventral surface	Yes	Yes	Yes	Yes	Yes
	Later ones tend towards horizontal	Yes	Yes	No	Yes	Yes
	Later ones tend towards remaining oblique	No	No	Yes	Yes	Yes
	Thick and square crested	Yes	Yes	No	Yes	Yes
	Remaining thin	Yes	Yes	Yes	Yes	Yes
Pattern style	Axial	Yes	Yes	No	Yes	No
	Spiral	Yes	Yes	Yes	Yes	No
	unpatterned	Yes	Yes	No	Yes	Yes

Figure 3. Comparison of species groups and sub-groups in *Cryptospira.*

Materials and Methods

Type material was examined at the Natural History Museum (BM(NH)) and the Liverpool Museum (MCM). Observations were supported by additional material present in the BM(NH), MNHN (CORINDON expedition material), and the Cambridge University Museum of Zoology (CMZ), the authors collection and in several other private European and Indonesian collections. Type material in the Paris, Geneva, Dusseldorf, and Cupra Maritima (Italy) museums was studied from digital photographs. Photographs taken by the author were taken with a Nikon D70 digital SLR camera with 60 mm macro lens and ring flash. On any one plate, whole shells are shown at the same magnification. Dimensions given are maximum shell length followed by maximum shell width, or maximum shell length only, and are of adult shells unless specified otherwise.

Abbreviations and symbols

MNHN: Muséum national d'Histoire naturelle, Paris
MHNG:Muséum d'Histoire Naturelle de Genève
LMD: Loebbecke Museum, Dusseldorf, Germany
BM(NH): Natural History Museum, London
NMW: National Museum of Wales, Cardiff
MGB: Museum Geologi Bandung, Bandung, Indonesia
MZB: Museum Zoologicum Bogoriense, Bogor, Indonesia
MMP: Museo Malacologia Piceno, Cupra Maritima, Italy
MZUB: Museo di Zoologiá dell'Università di Bologna, Italy
ZMUM: Zoological Museum of the University of Moscow
CMZ: Cambridge University Museum of Zoology, England
MCM: Merseyside County Museum, Liverpool, England
ANSP: Academy of Natural Sciences, Philadelphia, USA
ZMA: Zoological Museum of Amsterdam
MMM: Malacologia Mostra Mondiale, Cupra Maritima, Italy
AWC: Andrew Wakefield Collection, United Kingdom
TMC: Tony McCleery Collection, United Kingdom
BDC: Bunjamin Dharma Collection, Indonesia
SPC: Somwang Patamakanthin Collection, Thailand
FBC: Franck Boyer Collection, France
ATC: Andrew Tournier Collection, France
TCC: Tiziano Cossignani Collection, Italy
ICZN: International Code of Zoological Nomenclature
juv.: juvenile
sh.: dead collected shell
n. sp.: new species
†: fossil

SYSTEMATICS

Family **MARGINELLIDAE** Fleming, 1828
Subfamily **MARGINELLINAE** Fleming, 1828
Genus ***Cryptospira*** Hinds, 1844

Cryptospira Hinds, 1844: 76. Type species (by subsequent designation, Gray 1847: 142), *Marginella tricincta* Hinds, 1844.

Diagnosis

Shell small to moderately large (7 to 50 mm in length), cylindrical, elongate to elliptic, obovate, pyriform or subtriangular, thick, opaque, occasionally heavily but incompletely callused ventrally, uniformly coloured or with spiral bands and/or axial pattern; spire immersed, low or slightly elevated; lip thickened, internally smooth or denticulate; single external varix present, clearly demarcated by a groove; posterior notch absent or weak, siphonal notch absent or weak; columella with 4 to 6 plications occupying over half to two thirds of the apertural length. Sixth plication often remote, distinct callus often involving anterior 3 plications; first two plications very close to distally fused, occasionally an elongated parietal denticle present between fifth and sixth plications. Type 2 marginellid animal (Coovert & Coovert, 1995); siphon long; mantle smooth, extending over external shell surface (Figs 136, 148). Radula uniserial, relatively short, composed of relatively few (up to 48), overlapping, wide (0.06-0.158 mm), flat, multicusped (9-21 cusps) rachidian plates. Each oblong plate has a flat side and a cusped working side giving a 'comb-like' appearance (Fig. 4). The cusps increase in size up to the central cusp (statistics from Coovert, 1989(b)).

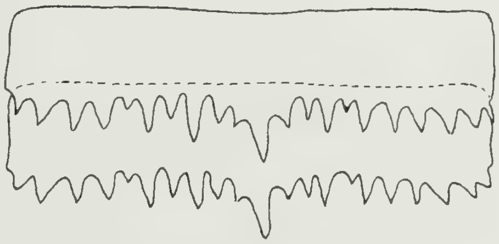


Fig. 4. Radula of *Cryptospira fischeri* (Bavay, 1902), from Coovert (1990) pl. 4, fig. 5.

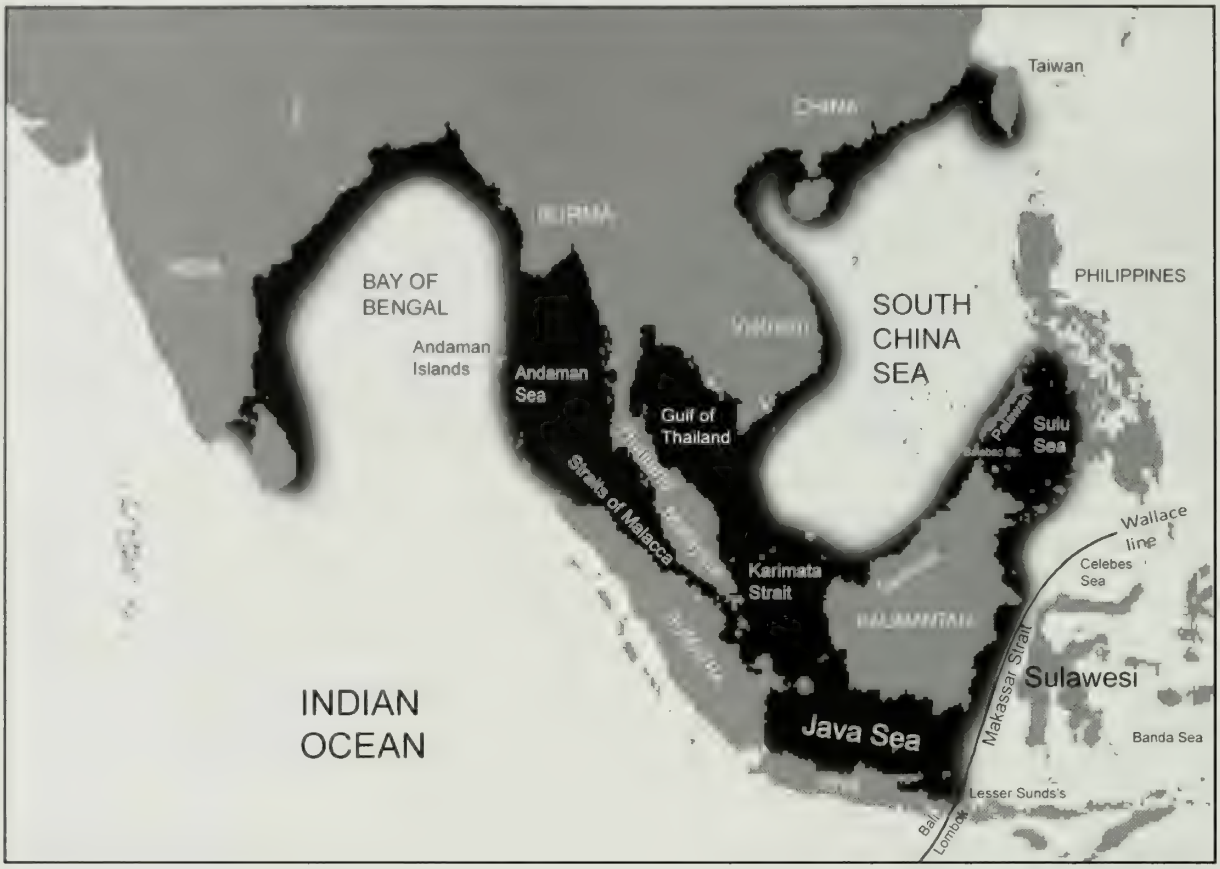

Taiwan
CHINA
BURMA
INDIA
BAY OF BENGAL
Andaman Islands
Andaman Sea
Vietnam
SOUTH CHINA SEA
PHILIPPINES
Gulf of Thailand
Palawan
Sulu Sea
Balabac Str.
Straits of Malacca
Wallace line
Celebes Sea
Karimata Strait
KALIMANTAN
Sulawesi
Makassar Strait
INDIAN OCEAN
Java Sea
Banda Sea
Lesser Sunds's
Bali
Lombok

Figure 5. Distribution range of the genus *Cryptospira*

(A) *CRYPTOSPIRA TRICINCTA* GROUP

This is the largest of the three groups, comprising at least nine species, and up to six more forms, some of which may also eventually reach recognition as distinct species. The principal characteristics of the *Cryptospira tricincta* group are:

- ovate, ob-ovate to elongate shape
- 7-30 mm adult length for recent and fossil shells
- columella with 5-7 plications occupying 2/3 of the aperture
  Note: exception is *C. quadrilineata* at 1/3
- Anterior ventral callus, where present, only extends to the end of the third columella plication
- uniform light grey, pale brown, pale greenish brown, or pale pinkish brown colour, often with dark and light alternating axial growth zone markings which never form a zig-zag pattern
- 3-4 narrow red-brown spiral lines or wider bands visible internally and/or externally, or absent, depending upon species
- Lip without denticles, central section straight to slightly convex, inserting to side or top of spire, opaque white, pale orange or light brown
- immersed to slightly elevated spire
- weak to very weak anterior and posterior ventral callus

The currently accepted species concept of *C. tricincta* (Hinds, 1844) is all inclusive of its widely ranging forms (see figs 9-38), yet the morphologies of these forms are so disparate and discontinuous that they are difficult to explain away as a single species. Many of these bear little relation to the syntype, original description and first figures of *C. tricincta* (Figs. 15, 16, 77, 78). Lumping together all of these forms under a single species name would therefore seem to be an extreme oversimplification, and it is likely that potential new species are buried within the taxon. In the light of this, and following the convention that the definition of *C. tricincta* has to be provided by the original description and figure, supported by the morphology of the type, it is proposed to review this situation of singularity. Of the forms which do not fit well with this definition, those that deserve full separation from it are;

1. The grey, heavy opaque form from Taiwan which appears to extend in its range southwest to Vietnam and possibly further on to Singapore. It

is herein considered to be a distinct species. It certainly overlaps in its geographical distribution with typical *C. tricincta*, but seems not to intergrade with it. It has incorrectly been referred to as *Marginella (Cryptospira) Bernardii* Largilliert, 1845 by Reeve (1864/5), Redfield (1870), Tomlin (1917) & Clover (1979). Abundant material is available for study and it is described herein as *C. cloveriana* n. sp. (Figs. 30-33).

2. A new species from the Makassar Strait with a totally distinctive pattern, colouration and morphology. It is described herein as *Cryptospira wallacei* n. sp. (Figs. 34-37) from limited material.
3. A new species with a thin, light and slender shell with a curved siphonal canal and a peak at the posterior labial insertion. This impressive and wholly original morph is found on the Gulf coast of Thailand. It is described herein as *Cryptospira mccleeryi* n. sp., from limited material (Figs 23-26).

Those that may be deserving of full species recognition, but which require further studies before formally being named are;

4. A bulbous, oval form from the Taiwan Strait, given the reference *Cryptospira cf. C. tricincta* form '*ovalis*' (Figs 27, 28), after Marratt, 1881.
5. A large, thin, inflated form with an axial lined pattern and only five thin and weak plications, from the Karimata Strait, western Kalimantan. Given the reference *Cryptospira cf. C. tricincta* form A. Known from only a single specimen in BDC (Fig. 18).
6. A small squat form with wide spiral bands found in southern Kalimantan. Given the reference *Cryptospira cf. C. tricincta* form B (Figs 13, 14).
7. A narrow elongated dwarf form with spiral bands found in deep water in the Makassar Strait and at shallower depths in southern Kalimantan. Given the reference *Cryptospira cf. C. tricincta* form C (Figs 19-22).
8. An inflated giant form found in deep water in the Makassar Strait. Given the reference *Cryptospira cf. C. tricincta* form D (Fig. 17). Found sympatrically with form C.
9. An olive green to brown form with no external banding and a white lip, from Kalimantan. Given the reference *Cryptospira cf. C. tricincta* form E (Fig. 12).

The evidence presented by these diverse living forms, supported by similar diversity in the fossil record (Figs 223-236, 241-253), provides the evidence that it is the multiple species concept of *C. tricincta* (of authors) which looks the most likely, rather than the currently held view of singularity.

Within the *Cryptospira tricincta* group, three further sub-groups can be recognized;

The *C. tricincta* sub-group

In the *C. tricincta* sub-group species and forms, the posterior end of the lip arches gracefully over the posterior end of the shell and inserts almost directly on top of the depressed and buried spire (Figs. 9-38). This imparts a curved profile to the aperture. The species included in this sub-group are C. *tricincta* (Hinds, 1844), (TS), (Including forms A-E. Possible syn; *Marginella ovalis* Marrat, 1881 [MS name]), *Cryptospira cloveriana* n. sp., *Cryptospira wallacei* n. sp. and *Cryptospira mccleeryi* n. sp.

The *C. fischeri* sub-group

In the *C. fischeri* sub-group species, the posterior end of the lip inserts nearer to or at the shoulder (Figs. 39-61) the effect of which is to reveal the spire and to straighten up the aperture. The species included are *C. fischeri* (Bavay, 1902), *C. sabelli* Cossignani, 2006, *C. immersa* (Reeve, 1865), (Syn; *C. quiquandoni* Cossingnani, 2006) and *C. onychina* (A. Adams & Reeve, 1848), and they gradually increase in size in the order *C. fischeri/sabelli* < *C. immersa* < *C. onychina.*

The *C. quadrilineata* sub-group

This mono-specific sub-group is represented by *Cryptospira quadrilineata* Gaskoin, 1849.

C. quadrilineata could be considered the 'odd-one out' of the *Cryptospira tricincta* group as a result of its unusual columella morphology, which is at considerable variance with all other members of the group. It has been retained in it because all of its other morphologic characters are correct for the group. It is acknowledged that the erection of a fourth, mono-specific *Cryptospira* group to house this species would be an alternative classificatory option.

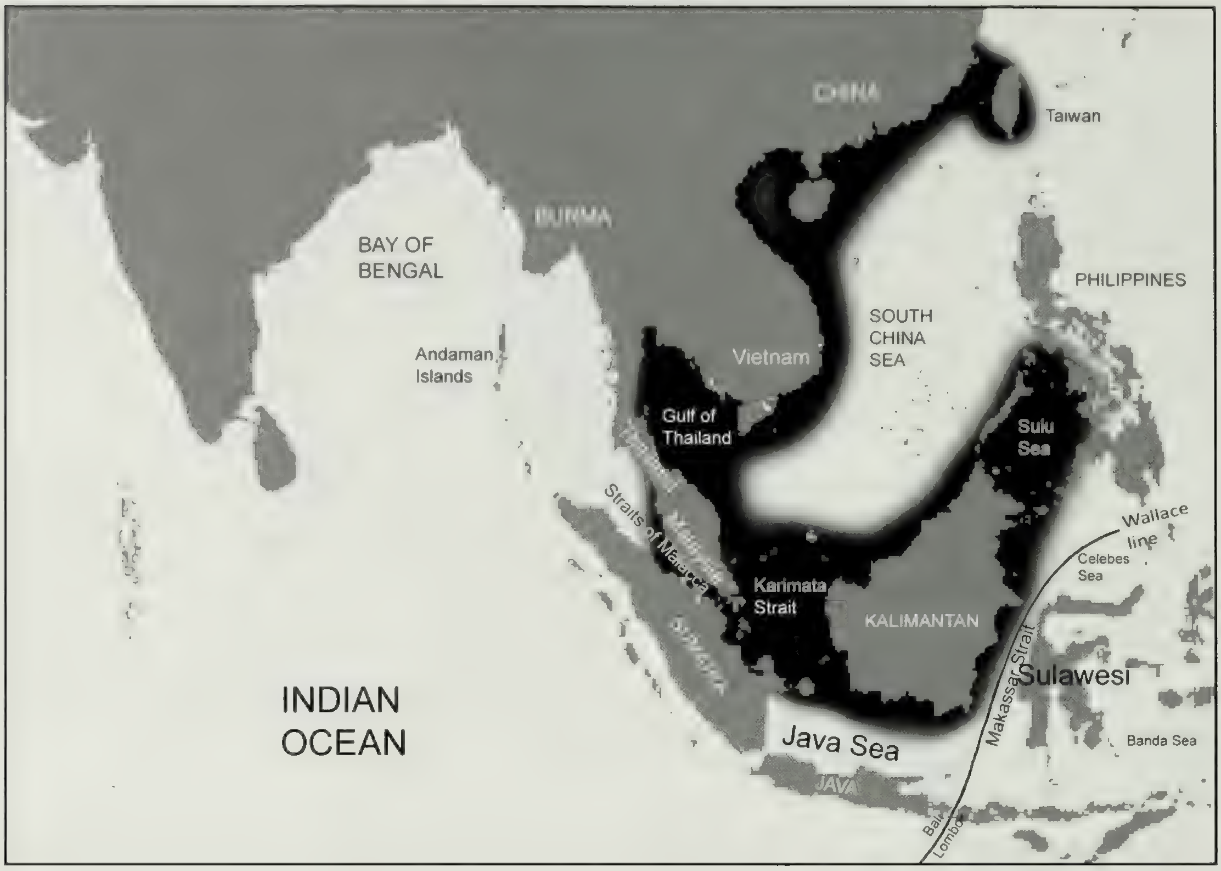

CHINA
Taiwan
BURMA
BAY OF BENGAL
PHILIPPINES
Andaman Islands
Vietnam
SOUTH CHINA SEA
Gulf of Thailand
Sulu Sea
Straits of Malacca
Malaysia
Wallace line
Celebes Sea
Karimata Strait
KALIMANTAN
Sumatra
Makassar Strait
Sulawesi
INDIAN OCEAN
Java Sea
Banda Sea
JAVA
Bali
Lombok

Figure 6. Distribution range of the *Cryptospira tricincta* group

(i) *Cryptospira tricincta* sub-group species.

Cryptospira tricincta (Hinds, 1844)
Figs 9-22, 27-29, 38, 73, 77, 78, 233-236, 241-253

Marginella (Cryptospira) tricincta Hinds, 1844(a) [Sept.] p. 76 & Hinds, 1844(b) [Oct] p. 46, pl. 13., figs. 12, 13.
Marginella (Cryptospira) ovalis Marratt, 1881 [MS name].
† *Cryptospira quinqueplicata* var. *minor* Martin, 1931

Type material. 2 spm, syntypes, Strait of Makassar, 11 fathoms, ex. Capt. Sir E. Belcher; 19.5 x 11.4 mm, Reg. No. 1844.6.7.38 (Figs 15, 16) & 25.5 x 15.7 mm, BM(NH) Reg. No. 1844.6.7.39 (Fig. 17).

The syntypes are light, inflated, pyriform, faded straw-coloured shells and one has three narrow reddish brown spiral lines on the body whorl, visible externally and internally. Tomlin (1917) recorded that the BM(NH) had two series, mounted on tablets: one of two specimens labelled 'Straits of Macassar, 11f., Sir E. Belcher, C.B.' and beneath the tablet '*tricincta*, Hds.' in Hinds' own handwriting: the other of three specimens labelled 'M.C., 11f., coarse mud, Str. Macassar, R. B. Hinds esq.'. A search only revealed the first series, and the tablet from which they had become detached. The smaller of the two syntypes (Figs 15, 16) most closely matches the description and original figure (Figs 77, 78), whereas the larger one (Fig. 17) is a specimen of *C. cf. C. tricincta* form D (see below).

Other material.

C. tricincta typical;
Mersing, East Coast Malaya, presented by R.D. Purchon, trawled, 1 spm, BM(NH).
North Borneo, Ex. A. Everett coll., 1 spm, BM(NH).
North Borneo, Brunei, Ex. P. W. Barrett-Smith coll., 1 spm, BM(NH).
Northwest Borneo, Natuna Is, net at 30 fathoms, 2 spm, 17.5 x 10.9 mm, 15.9 x 9.8 mm, AWC.
West Borneo, Karimata Strait, net at 20 fathoms, 2 spm, 18.9 x 11.4 mm, 15.6 x 9.6 mm, AWC.
East Borneo, Samarinda, 20 fthms, 1 spm, 28.6 x 15.9 mm, AWC.
East Borneo, Makassar Str., 5 spm, BM(NH).
East Borneo, Makassar Str., Pulau Balabalangan, 1 spm, 25.2 x 14.5 mm, (Fig. 38), AWC.
South Sumatra, Tulang Bawang, trawled 10-15m, 1 spm, 20.0 x 11.5 mm, (Figs 9, 10), AWC.
South Sumatra, Tanjung Menjangan, trawled in 10-15 metres, 2 spm, 21.1 x 12.7 mm, 17.8 x 11.0 mm, AWC.
East Sumatra, Syap Is., near Singkep Is., net 20 fathoms, 5 spm, 23.1 x 13.6 mm, 20.7 x 12.7 mm, 25.2 x 14.7 mm, 19.3 x 11. 8 mm, 20.0 x 12.0 mm, AWC.

East Sumatra, Bangka Is., trawled 10-15 metres , 2 spm, 22.4 x 13.5 mm, 17.5 x 11.0 mm, AWC.
East Sumatra, Tanjung Pinang, net in 20 fathoms, 2 spm, 17.0 x 10.5 mm, 15.4 x 9.2 mm, AWC.
Southeast Sumatra, Dua Is., Mesuji, trawled 10-15 metres, 2 spm, 20.5 x 12.9 mm, 22.2 x 13.3 mm, AWC.
Philippines, Palawan, Balabac Strait, 25 spm, 23 – 26.5 mm, (Fig. 11), AWC.
Vietnam, Nha Trang, 1 spm, 23.2 x 13.3 mm, (Fig. 29), AWC.
Vietnam, Nha Trang, 4 spm, MMM.
Hong Kong, 5 fathoms, B. Smith coll. Admiralty, 1 spm, BM(NH).
Southern China, 1 spm, 19.5 x 10.7 mm, trawled May 2007, AWC.

C. cf. C. tricincta form *ovalis*;
Taiwan Strait, trawled on gravel/sand in 40 metres, February 2010, 1 ad. spm., 21.9 x 15.1 mm, (Figs 27, 28), AWC.

C. cf. C. tricincta form A;
Western Borneo, Karimata Strait, in 20 fathoms, 30.0 x 17.0 mm, (Fig. 18), BDC.

C. cf. C. tricincta form B;
South Borneo, South Banjarmasin, net 20 fathoms, 3 spm, 9.3 x 6.0 mm (juv), 12.9 x 8.7 mm, 13.0 x 8.8 mm, 15.0 x 10.0 mm (Figs 13, 14), AWC.

C. cf. C. tricincta form C;
South Borneo, Sampit, net at 20 fathoms, 2 spm, 13.6 x 7.8 mm, 13.3 x 7.5 mm, (Figs 19, 20), AWC.
East Borneo, Makassar Str., 01° 08'S 117°18'E, trawled 49 metres, CORINDON Exp., st. CH205, 1 juv. spm, 12.2 x 6.3 mm, 1 spm, 13.0 x 6.9 mm (Figs 21, 22), MNHN.
East Borneo, Makassar Str., 00°40'N 117°51'E, dredged 96 metres, CORINDON Exp., st. DR216, 2 spm, 15.5 x 8.8 mm, & 15.5 x 9.5 mm, MNHN.

C. cf. C. tricincta form D;
East Borneo, Makassar Str., 00°40'N 117°51'E, dredged 96 metres, CORINDON Exp., st. DR216, 1 spm, 28 mm, MNHN.

C. cf. C. tricincta form E;
Northeast Borneo, Pula Sapangar, 2 spm, 19.0 x 11.45 mm, 18.6 x 11.5 mm, AWC.
Brunei, Jenudong Beach, from dredger pumping onto beach, 2 ad. spm., 22.4 x 13.1mm (Fig. 12), 24.1 x 13.6mm, AWC.

Type locality. Strait of Makassar, Indonesia.

Distribution. Widespread in the Sunda Shoal area (Java Sea and the Straits of Karimata and Makassar); from the north coast of Kalimantan southwest to the lower end of the Strait of Malacca (Malaysian Peninsula), and northeast to Palawan in the Philippines. It also extends along the northern coastline of the South China Sea, from Vietnam to the Taiwan Straits (Fig. 6).

Habitat. Soft muddy sand and gravel in 10 to 100 metres.

Descriptive notes. Shell small to medium sized (L= 12.5-30 mm, W:L ratio 55-69%), moderately thin, ovoid to sub-pyriform, inflated posteriorly, tapering smoothly to base. Colour light tan, creamy, pinkish, or pale greenish with or without axial growth line markings. Lip cream to opaque white. Four red-brown narrow spiral lines on body whorl; first at level of or just posterior to fourth plication, second at the level of the sixth plication, third halfway between the second spiral line and posterior labial insertion, and the fourth, often almost completely obscured, at the suture. Spire involute, immersed in callus. Shoulder smooth, rounded. Posteriorly, aperture as wide as labial varix, widening anteriorly. Lip thickened externally as a single varix with a smooth rolled edge. External varix groove present. Siphonal notch absent, posterior notch weak to absent. Lip extending beyond apex, curving round to insert into callus fractionally to labial side of spire. Columella with six plications (rarely only five) occupying anterior 2/3 of apertural length; first moderately strong, long, rounded in cross section, at 45° to axis; second very strong, long, close to first plication, edge flattenned, also at 45° to axis; third very strong, long, square in cross section, at 60° to axis; fourth slightly less strong, long, square in cross section, 80° to axis; fifth moderately strong, short, square in cross section; sixth often remote from fifth, short, often with a denticle at its distal end. Columella excavated between 2nd and 3rd plications. Anterior ventral callus merging laterally with the external varix and medially with the distal ends of the first four plications. Anterior end rounded. Parietal surface posterior to plications is smooth, callus absent to weak.

Remarks. The original description of *C. tricincta* in the Proceedings of the Zoological Society, September 1844 was confined to text only as follows:
'*Mar. testa obeso-ovata, cinereo-caerulescente, fusco trifasciata, labro incrassato, luteo, intùs laevi; columella sexplicata, ad basin alba; plicis tribus superioribus transverses, suprema paululùm obsoleta.*'
This translates as 'ob-ovate shell, greenish-ash coloured, with three darker bands, lip thick, golden yellow, inside on the left; columella six-plicate, white towards the base, first three superior plications transverse, the highest somewhat obsolete'.
The first illustrations (Figs 77, 78) appeared in October that same year in Hinds' account of the molluscs found on the voyage of the Sulphur (1844b). It was subsequently illustrated by Sowerby (1846), Chenu (1849), and Reeve (1864).

Marginella (Cryptospira) ovalis is considered here to be a regional form of *C. tricincta*. It was 'described' in one of F. P. Marrat's conchological leaflets, which were printed in small numbers and circulated for the benefit of his close acquaintances. *M. (C.) ovalis* is thus considered to be a manuscript name only. It was recorded as coming from Swatow, China (now known as Shantou, situated 300km northeast of Hong Kong at the entrance to the Taiwan Strait), which is at the northern end of the range of *C. tricincta*. Marrat described it as being a pale straw colour, with three spiral lines on the body whorl and having an orange labrum and columellar base. A search for this shell in the Marrat collection in the Liverpool Museum (Merseyside County Museums, England) was undertaken by the author but proved fruitless. Its original figures (Figs 79, 80) and description appears to be accurate enough to confirm its identity as *C. tricincta*, and this is confirmed by the acquisition of a fresh specimen from the Taiwan Strait by the author (Figs 27, 28). The remaining forms A-E of *C. tricincta* were discussed earlier.

Although Reeve (1864) referred to *C. tricincta* as the 'three-girt marginella', each patterned species in this group potentially has four spiral lines. In *C. tricincta*, the sub-sutural spiral line tends to be obliterated by the insertion zone of the posterior labial callus.

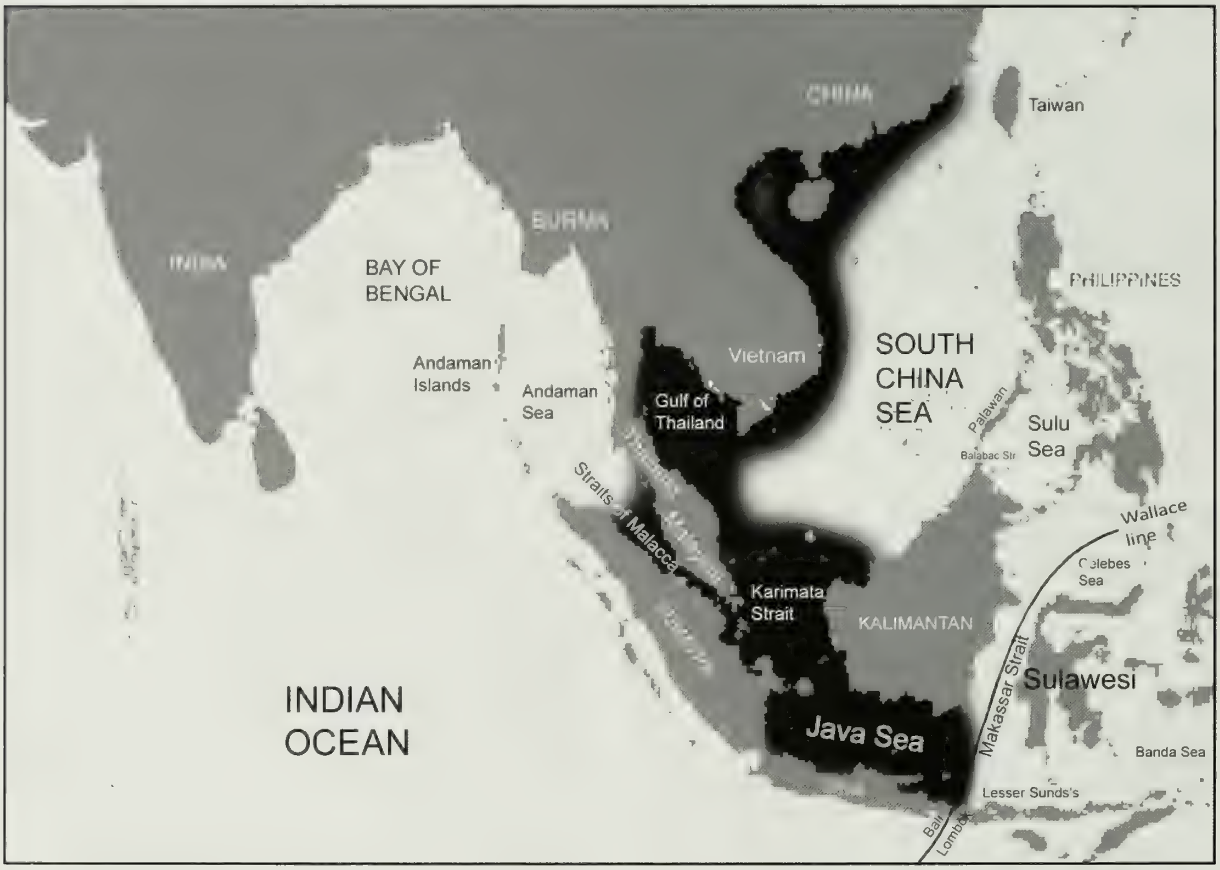

CHINA
Taiwan
BURMA
INDIA
BAY OF BENGAL
PHILIPPINES
Andaman Islands
Andaman Sea
Vietnam
Gulf of Thailand
SOUTH CHINA SEA
Palawan
Balabac Str
Sulu Sea
Straits of Malacca
Wallace line
Celebes Sea
Karimata Strait
KALIMANTAN
Makassar Strait
Sulawesi
INDIAN OCEAN
Java Sea
Banda Sea
Lesser Sunds's
Bali
Lombok

Figure 7. Distribution range of the *Cryptospira ventricosa* group

Cryptospira cloveriana n. sp.

Figs 30 - 33, 65

Type Material. Taiwan, Southeast of Kaohsuing, 20 fathoms, ex. P. Clover, 5 spm;
Holotype, 20.3 x 12.9 mm, BM(NH) Reg. No. 20100331 (Figs 32, 33); Paratype 1, 21.3 x 13.5 mm; Paratype 2, 19.6 x 12.2 mm; Paratype 3, 19.6 x 11.8 mm; Paratype 4, 19.6 x 12.9 mm, BM(NH) Reg. Nos. 201000332/1 - 4.

Other Material Examined. Taiwan, An Ping, 2 spm, 22.5 mm, 23.2 mm, 23.3 mm, FBC.
Taiwan (southwest), 20 – 40 fathoms, 7 spm, 20.5 - 29.3 mm, ATC.
Taiwan, Chii Lung, 1 ad. spm., 22.5 x 13.5 mm, AWC.
Taiwan Straits, trawled, 1 ad. spm., 19.5 x 12.4 mm, AWC.
Vietnam, Nha Trang, 2 spm, 25.7 x 16.1 mm (Fig. 30), 25.5 x 15.3 mm (Fig. 31) , AWC.
Vietnam, Nha Trang, 3 spm, 24.6 - 27.9 mm, MMM.
Singapore, 2 spm, 23.9 x 14.9 mm, 23.5 x 14.0 mm, AWC.

Distribution. Taiwan, along the Chinese coast to Vietnam, and on to Singapore.

Habitat. On sand and gravel to 40 m.

Description. Shell medium sized (L = 19-26 mm, W:L = 62-63 %), thick, heavy, barrel-shaped. Colour even pale to mid grey with darker and lighter axial growth line markings. Lip edge opaque white, darkening to dark grey at marginal groove. Spiral pattern absent externally and internally, or three very faint internal spiral lines. Spire submerged, callus over apex joining with labial insertion. Shoulder smooth, rounded. Aperture as wide as labial varix, only slight widening anteriorly. Lip thickened, with single varix, denticles absent. External varix groove present. Siphonal notch absent, posterior notch weak to moderately strong. Posterior end of shell extending beyond apical level. Lip curves sharply to insert into apical callus cap fractionally to labial side of apex. Columella with six very strong, flat-crested plications, occupying 2/3 of aperture, extending markedly across parietal surface and terminating abruptly. First two plications close together, oblique, remaining plications becoming more perpendicular to long axis. First three plications merge with anterior ventral callus. Second to fifth plications equidistant. Sixth plication remote. Ventral callus pad present opposite labial insertion deepens posterior notch. Anterior end rounded.

Type Locality. Kaohsuing, Taiwan.

Remarks. When compared with the typical form of *C. tricincta,* specimens of *C. cloveriana* have solid, heavy, barrel-shaped shells with stronger, more emergent plications, usually have no sign at all of the three spiral bands internally, never show the spiral bands externally, are a bluish-grey colour, often with fine, alternating light and dark axial growth lines, and have an opaque white lip turning darkish grey at the marginal groove. They are often imperfect and scarred.

In 1970, Phillip W. Clover deposited five voucher specimens of this species from Kaohsuing, Taiwan, in the BM(NH) collection, and it is these which have been selected as the type lot (holotype and four paratypes). Notes accompanying this lot state '*these shells identified and widely sold as bernardii (Habes#2 book pl. 35, no 1). However, these are not typical of the types. They seem to be tricincta without bands. I have seen a few with very faint bands within the aperture*'. From the context of this note it would seem that Clover was comparing them to the types of *C. onychina* (which were annotated later with the name *M. bernardii*), a good species. *C. cloveriana* n. sp. is indeed often labelled *C. Bernardii* Largilliert, 1845 (Clover, 1979; Cossignani, 2006) but the assignation of this name demands closer scrutiny. *M. (C) Bernardii* was described by Largilliert as having five columella plications, with the internal aspect of the labial shoulder bearing denticles, and brown zig-zag axial lines decorating the last whorl. Contrast this with C. *cloveriana* n. sp. which has six plications, a smooth lip, and if any axial streaks are present they occur along growth lines and do not describe a zig-zag pathway. The holotype of *M. Bernardii* is missing from the MNHN in Paris but the original description and accompanying illustration (Figs 91, 92) clearly reveal it to be a small, narrow variety of *C. strigata* (Dillwyn, 1817). The length of the shell is given as 22 mm, which although small for *C. strigata*, still lies within its size range, which has specimens as small as 12 mm at its lower end (AWC & BDC). Therefore, the name *M. (C.) Bernardii* should only be used when referring to the synonymy of *C. strigata*, a member of the *Cryptospira elegans* group. Its application to any taxon from the *Cryptospira tricincta* group should be discontinued.

A series of shells from off Nha Trang, Vietnam (MMM, pictured in Cossignani, 2006: pp. 321-322, all designated *C. tricincta* by the author of that book) are clearly separable into specimens possessing the characteristics of typical *C. tricincta*, namely finer, thinner shells with three internal *and* external spiral lines and a yellowish lip and a greenish or brownish body whorl and others which are more robust, pale to dark grey, having a narrower aperture, a white lip becoming grey at the marginal groove, stronger and longer plications, very faint or no internal banding and completely absent external banding, all of which are characters of *C. cloveriana*. No intergrades are shown, and it is not known if any such specimens were selected out. To check this, an independent search of specimens sourced from Nha Trang was undertaken and it was possible to easily locate examples of both of these forms (Figs 29-31) but no progressively intergrading series of shells between the two forms could be found or assembled. It would seem that, at least in Nha Trang, both *C. tricincta* and *C. cloveriana* occur sympatrically. In the authors collection are two specimens from Singapore which also exhibit the characteristics of *C. cloveriana*, and it is likely that this represents the southern end of the range of this species.

Both *C. tricincta* and *C. cloveriana* also occur northeast along the Chinese coast. *C. tricincta* becomes rare in Taiwanese waters, where *C. cloveriana* takes over as the dominant morph, but it has been found recently in sand and gravel in 40 metres in the Taiwan Strait (Figs 27, 28), comparing well with the description of Marrat's *C. ovalis*. Interestingly, the oval profile of the shell and strong plications match those of many Taiwanese specimens of *C. cloveriana*, yet the thinner body whorl and presence of clear internal and external banding and a rich yellowish coloured labial margin clearly place it as a form of *C. tricincta* as defined here.

Examples of *C. cloveriana* from Vietnam are not quite as thick and callused as their Taiwanese counterparts. The extremely thickened, heavy, grey, totally non-banded and often scarred shells from this extreme northern end of the range are probably ecophenotypic effects resulting from the adaptation of the animal to harsher environmental conditions and heavier predation.

In some parts of northern Kalimantan, solid greenish-grey specimens with the pyriform profile of typical *C. tricincta* are found. These too completely lack external spiral lines and their internal ones are either very weak or absent altogether (Fig. 12). These have been referred to here as *Cryptospira cf. C. tricincta* form E. They are not regarded as *C. cloveriana* because they have relatively weak plications, their overall shape is closer to *C. tricincta* and the colour is greenish rather than grey.

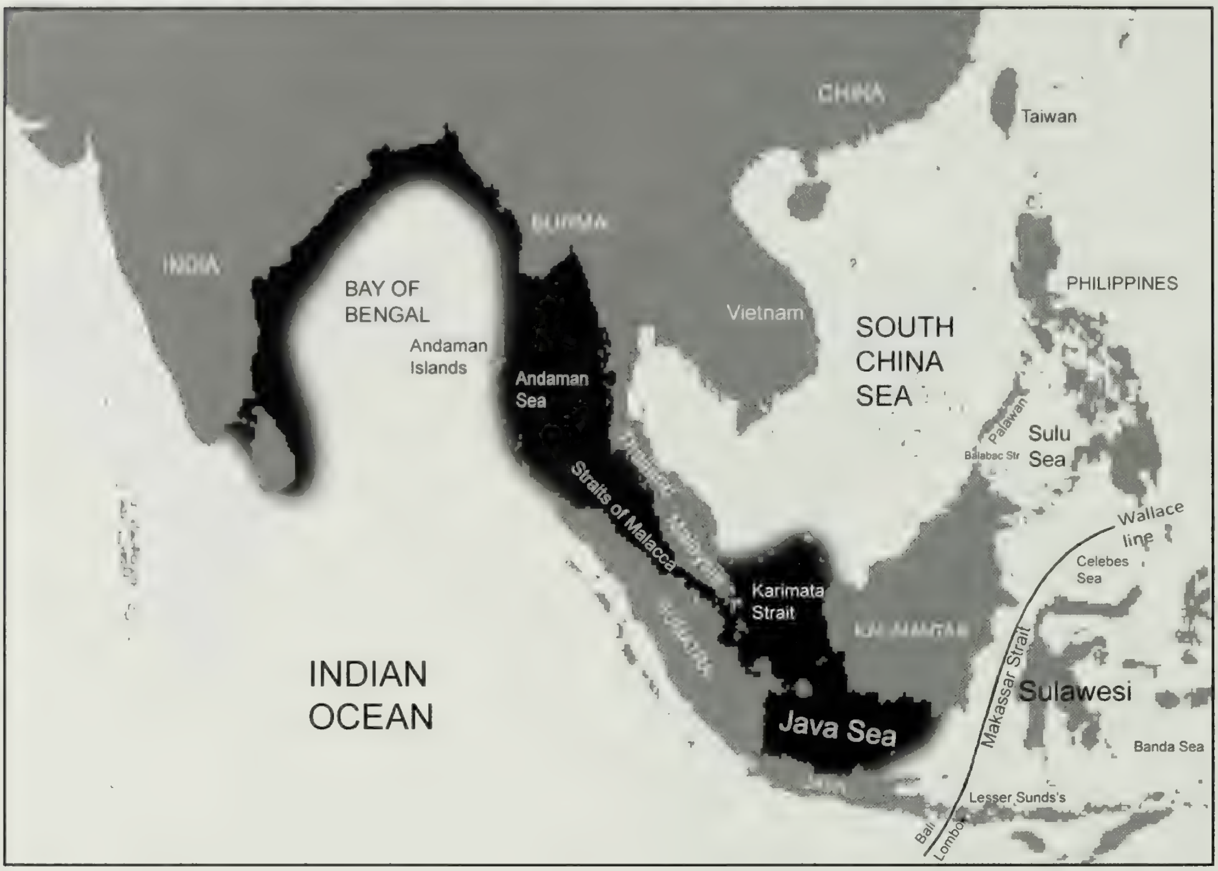

CHINA
Taiwan
INDIA
BURMA
BAY OF BENGAL
Andaman Islands
Andaman Sea
Vietnam
SOUTH CHINA SEA
PHILIPPINES
Palawan
Balabac Str
Sulu Sea
Straits of Malacca
Wallace line
Celebes Sea
Karimata Strait
KALIMANTAN
INDIAN OCEAN
Java Sea
Makassar Strait
Sulawesi
Banda Sea
Lesser Sunds's
Bali
Lombok

Figure 8. Distribution range of the *Cryptospira elegans* group

Cryptospira wallacei n. sp.
Figs 34 - 37, 133

non-*Marginella (Egouena) wallacei* Jousseaume, 1875 (= *Prunum rostrata* Redfield, 1870).

Type material. Pulau Balabalangan, 02° 26.3' S 117° 25.3' E., East Kalimantan (Makassar Strait), 3 ad. and 1 juv. spms;
Holotype, 22.0 x 12.6 mm, BM(NH) Reg. No. 20100328 (Figs 34, 35).
Paratype 1, 21.9 x 12.3 mm, AWC (Figs 36, 37)
Paratype 2, 22.0 x 12.5 mm, BDC.
Paratype 3, juv., 12.0 x 7.5 mm, BM(NH) Reg. No. 20100326.

Type locality. East Kalimantan, Makassar Str., Pulau Balabalangan, 02° 26.3' S 117°25.3' E.

Distribution. Only known from the type locality.

Habitat. In sand patches amongst coral in 5-10 m.

Description. Shell medium sized (L = 22 mm, W:L = 57 %), heavy, smooth, shiny, elongate pyriform, pale creamy yellow with four wide pale purplish brown bands, first band originating at level of fourth plication, second & widest band between fifth and sixth plication, third band halfway between sixth plication and posterior labial insertion, fourth band on top of spire. Pale purplish brown axial streaks, following growth lines, irregular in density of colour and frequency. Lip white ventrally, strong yellow orange external varix, varix groove more deeply coloured. Lip straight for most part, angling over at level of third spiral band to insert posteriorly on top of spire. Aperture narrow, flaring very slightly anteriorly. Columella straight, with six placations occupying 2/3 of apertural length; first moderately strong, long, rounded in cross section, at 45° to axis; second very strong, long, close to first plication, flat topped, also at 45° to axis; third very strong, long, square in cross section, at 60° to axis; fourth slightly less strong, long, square in cross section, 80° to axis; fifth moderately strong, short, square in cross section; sixth often

remote from fifth, short, often with a denticle at its distal end. A very strong elongated denticle present between fifth and sixth plications. Anterior ventral callus merging laterally with the external varix and medially with the distal ends of the first four plications. Parietal surface posterior to plications is smooth. Strong anterior ventral callus from distal end of first to third plications, fusing with external varix anteriorly, creating a wide columella base. Strong posterior ventral callus from the denticle between fifth and sixth plications to posterior labial insertion, ending in a raised pad of opaque white callus forming a false posterior notch.
Animal not observed.

Remarks. This beautiful new species is currently known from limited material collected in shallow sediments off eastern Kalimantan on the biogeographic boundary known as the 'Wallace Line', at the leading edge of the Sunda Shelf. In a comparison with *C. tricincta*, C. *wallacei* has a different colour pattern (wide spiral bands and alternating light and dark axial streaks), a different shape (elongated narrow shell with wide columella base) and an elongated denticle between the 5th and 6th plication. The discovery of a specimen of *C. tricincta* (Fig. 38) sympatrically with *C. wallacei* serves to reinforce the fact that *C. wallacei* is not a local form of *C. tricincta* but is a distinct species.
The small narrow form (Figs 21, 22) collected by the CORINDON Expedition (MNHN) from deep water in the strait, lacks the wide spiral bands, heavy callus and extra parietal denticle of *C. wallacei*, and is listed here as *Cryptospira cf. C. tricincta* form C.

Etymology. *C. wallacei* n. sp. is named in honour of Alfred Russel Wallace (1823 - 1913), English naturalist, explorer, anthropologist and biologist, who explored the geological and geographical pattern of species divergence, and in so doing became the founder of modern biogeography.

Cryptospira mccleeryi n. sp.
Figs 23-26

Type material. Thailand, Gulf of Thailand, Pattani Province, from prawn trawlers, 2 ad. spm.;
Holotype, 29.8 x 15.6 mm, (Figs 25, 26), BM(NH) Reg. No. 20100329; Paratype, 31.2 x 16.5 mm, (Figs 23, 24), SPC.

Type locality. Pattani Province, Gulf of Thailand.

Distribution. Only known from the type locality.

Description. Shell large (L= 29.8 mm, W:L = 52 %), thin, light, elongate-ovate to sub-pyriform, tapering to base. Colour pale cream, including lip. Three narrow spiral lines, first at level of fourth plication, second at level of sixth plication, third halfway between sixth plication and labial insertion. Spire submerged, covered with callus from labial insertion which is directly on top of apex. Shoulder gently rounded, smooth. Aperture as wide as labial varix to level of the sixth plication gradually widening to twice as wide. Lip thickened externally as a single varix with a smooth, pale, rolled edge. External varix groove present. Siphonal notch absent, posterior notch deep. Lip extends to a peak beyond apex, curving round to insert into callus directly over apex. Columella with six plications occupying 2/3 of apertural length; first two close together, fine edged, and oblique. Plications three to five flat crested, gradually becoming perpendicular to axis. Very weak sixth plication remote from fifth. Columella slightly concave between second and third plications. Anterior ventral callus merging with first three plications. Anterior end rounded. Parietal surface posterior to plications smooth, callus absent.

Remarks. This morph has been named as a distinct species on the basis of its distinctive, elongated form and very pronounced extension of the posterior end of the lip. It appears to be rare and only known by its type material.

Etymology. *Cryptospira mccleeryi* n. sp. is named in honour of Tony McCleery who has done so much to advance the scientific understanding and species diversity of the Marginellidae and Cystiscidae.

(ii) *Cryptospira fischeri* sub-group species.

Cryptospira fischeri (Bavay, 1902)
Figs 42 - 52, 69, 81

Marginella fischeri Bavay, 1902, I, 407, pl. viii, figs 10, 11.

Type material. 1 spm, syntype, 10.3 x 6.0 mm (Fig. 47), no loc., Collection du Journal de Conchyliologie, MNHN.

Other material. Northwest Borneo, Subi Is., 4 spm, 8.0 - 9.2 mm, in fisherman's net, 70 m, AWC, (Fig. 43).
Thailand, Ranong, 1 spm, 8.0 mm, AWC, (Fig. 42).
Philippines, Palawan, 100 spm, Length 10 - 13.0 mm, AWC, (Figs 44-46, 48-52)
Philippines, South Palawan, 10 spm, ATC.
Philippines, Davao, 1 spm, 11.8 mm, FBC.
Philippines, Palawan, Balabac, 10 spm, FBC.
Philippines, Sulu Archipelago, Tawi Tawi Island, 1 spm, 12.0 mm, AWC.

Type locality. Unknown.

Distribution. From southern Thailand, along the northern coast of Kalimantan into Palawan and the central Philippines (Sulu Sea).

Habitat. In muddy sand in approximately 15 –20 m.

Descriptive notes. Shells are small (L = 10 - 13 mm, W:L = 58-69 %), pale straw to greenish-grey. Four red-brown narrow spiral lines encircle the body whorl; the first line emerges at the level of, or just above the fourth plication; the second emerges just beneath the sixth plication; the third emerges halfway between the sixth plication and the posterior labial insertion and the fourth lies just below the suture. The shoulder smoothly curves or is slightly angular. The lip is straight and inserts posteriorly at the shoulder below the apical level. Six columella plications, occupying 2/3 of the aperture; first two close, oblique. Third to fifth becoming more perpendicular to the axis. Sixth plication finer, thin edged, more emergent than the fifth plication and remote from it. Aperture evenly narrow along entire length, as wide as labial varix, and straight. Labial insertion at shoulder, lip thinning to a fine edge at the posterior notch. Parietal surface posterior to the plications smooth and lacking callus deposit.

Remarks. The insertion of the lip in *C. fischeri* is always at the shoulder. This leaves the entire spire morphology and pattern fully visible (Fig. 69) and creates a relatively straight aperture when compared with, say, *C. tricincta*. There are four spiral lines in total, three on the body whorl and one subsuturally, visible on the spire in clearly marked specimens (Figs 48-50). It is interesting to note that on the type specimen (Fig. 47) the centrally placed spiral line is absent. The absence of this particular line is a phenomenon commonly seen in this species and it has also been noted by the author in a specimen of *C. quadrilineata*. Four spiral lines are also present in the closely related *C. immersa*, but they are always less distinct and that species is larger. The spire of *C. fischeri* is usually more elevated than that of *C. immersa* and will always separate it from the very flat or depressed spire of *C. onychina*. The thicker shell, stronger and longer plications and lack of colour and pattern of *C. šabellii* appear to be reliable characters with which to distinguish it from *C. fischeri*.

Specimens of *C. fischeri* west of the Balabac passage are small and thin, with weak columellar plications and very faint or absent spiral lines (< 10 mm in length, W:L ratio 59 - 60 %, Figs 42, 43) compared with specimens from Palawan and the central Philippines, which are often more substantial shells tending towards a more intense colour and pattern (Figs 48-52). At 10 - 14 mm in length, they are often much larger, and can be elongated (Fig. 49), subtriangular (Figs 50, 52), or rather ovoid (Fig. 48), giving a wide W:L ratio of 59.5%-66.9%. A mixture of all of these morphologies was found in a large unselected sample of 100+ specimens from Palawan and there is no evidence as yet to separate them into different species.

Coovert (1990) examined the radula of this species (Fig. 4). The radula has 48 plates, each with a straight basal edge, and 21 cusps per plate along the cutting edge. The central cusp is strongest and is flanked on either side by a subordinate cusp, with the remaining cusps being irregular.

There are many shells in recent circulation incorrectly identified as *C. fischeri* (Figs 60, 61). These Palawan specimens are much larger (16 - 20 mm in length) and the lip extends posteriorly beyond the immersed spire. These are in fact examples of *C. onychina* (A. Adams & Reeve, 1848).

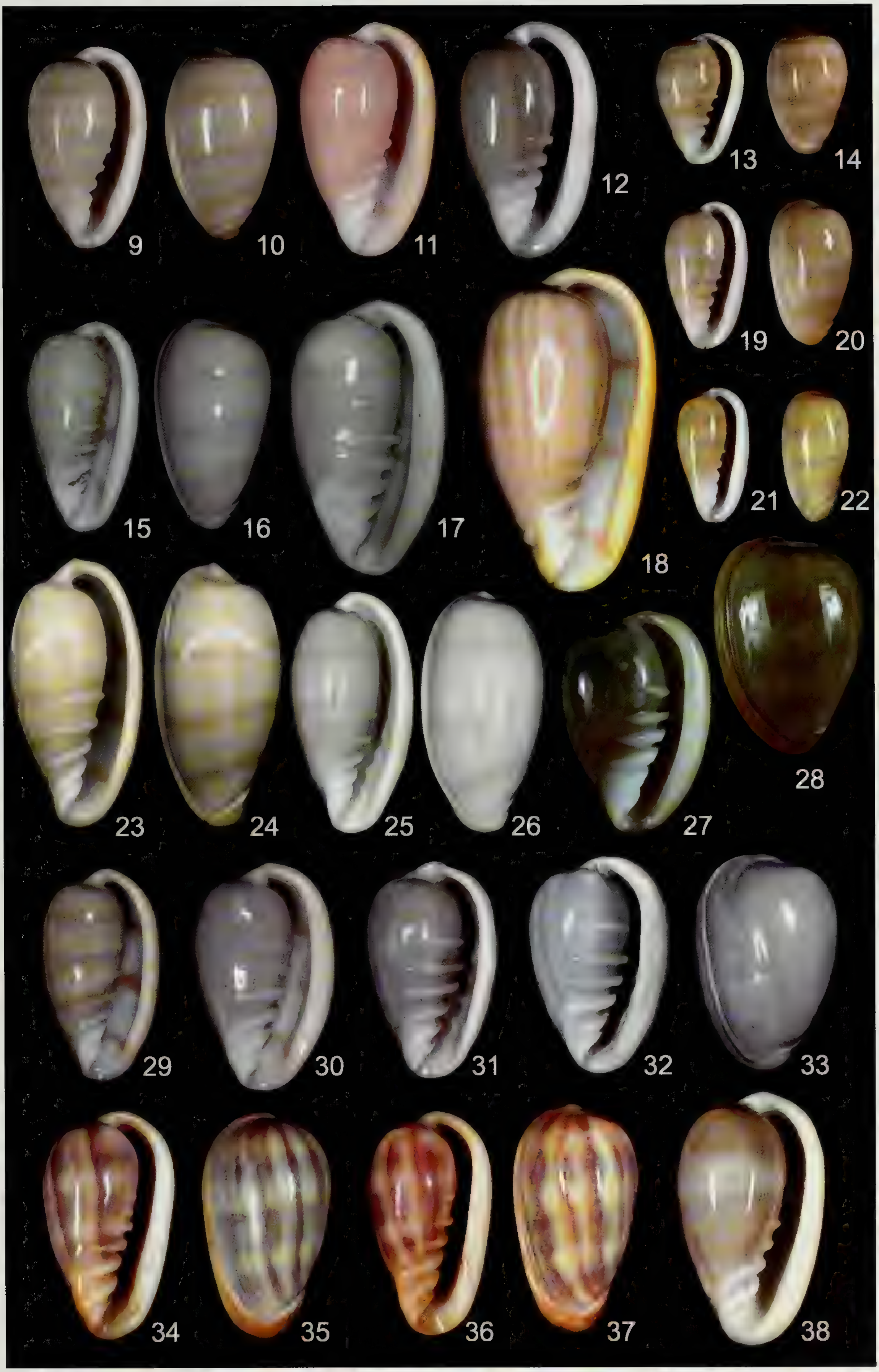
Figures 9-38. ***Cryptospira tricincta*** **group.**

9-22, 27-29, 38. ***Cryptospira tricincta*** **Hinds, 1844**
9-10. Sumatra, Tulang Bawang, 20.0 x 11.5 mm, AWC. ; **11.** Palawan, Balabac, L = 23.5 mm, AWC; **12.** Brunei, Jenudong Beach, 22.4 x 13.1 mm, AWC; **13-14.** South Borneo, Banjarmasin, in 60 m, 15.0 x 10.0 mm, AWC; **15-16.** 19.5 x 11.4 mm, Syntype, BM(NH) Reg. no. 1844.6.7.38; **17.** 25.5 x 15.7 mm, Syntype, BM(NH) reg. no. 1844.6.7.39; **18.** Western Borneo, Karimata Strait, in 60 m, 30.0 x 17.0 mm, BDC; **19-20.** South Borneo, Sampit, 60 m, 13.3 x 7.5 mm, AWC; **21-22.** Makassar Strait, CORINDON Expedition, 01° 08' S 117°18' E, 13.0 x 6.9 mm, MNHN; **27-28.** Taiwan Strait, 21.9 x 15.1 mm, AWC; **29.** Vietnam, Nha Trang, 23.2 x 13.3 mm, AWC; **38.** Makassar Strait, Pulau Balabalangan, 02°2.3' S 117°25.3' E, 25.2 x 14.5 mm, AWC.

23-26. ***Cryptospira mccleeryi*** **n. sp.** Thailand, Gulf of Thailand, Pattani Province;
23-24. Paratype, 31.2 x 16.5 mm, SPC; **25-26.** Holotype, 29.8 x 15.6 mm, BM(NH) Reg. no. 20100329.

30-33. ***Cryptospira cloveriana*** **n. sp.**
30. Vietnam, Nha Trang, 25.7 x 16.1 mm, AWC; **31.** Vietnam, Nha Trang, 25.5 x 15.3 mm, AWC; **32-33.** Southeast of Kaohsuing, Taiwan, holotype, 20.3 x 12.9 mm, BM(NH) Reg. no. 20100331.

34-37. ***Cryptospira wallacei*** **n. sp.** Makassar Strait, Pulau Balabalangan Group, 02° 26.3' S 117° 25.3 E.
34-35. Holotype 22 x 12.6 mm, BM(NH) Reg. no. 2010032; **36-37.** Paratype 1, 21.9. x 12.3 mm, AWC.


9
10
11
12
13
14
19
20
21
22
15
16
17
18
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38

Cryptospira sabellii Cossignani, 2006

Figs 39 - 41, 70

Cryptospira sabellii Cossignani, 2006. (April), 51: 5, 6

Type material. Borneo, 1° 42.44'N 108° 22.92'E: holotype, 9.72 mm (Fig. 39), MMP; Paratype 1, 9.97 mm (Fig.40), TCC; Paratypes 2 & 3, 9.09 mm & 9.30 mm, MMM; Paratype 4, 8.50 mm, MZUB; Paratypes 5 - 18, unmeasured, MMM.

Other material. Natuna, Northwest Borneo, 1 spm, Length 9.5 mm, in fisherman's net, 120 m, AWC.
Pejantan, West Borneo, 4 spm, 9-10.5 mm, in fishermans net, 60 m, (Fig. 41), AWC.

Type locality. North Borneo, 1° 42.44' N 108° 22.92' E.

Distribution. Restricted to the northern coast of Borneo.

Habitat. Type material dredged at 48 m. The species is a deep water one.

Descriptive notes. The shell is identical to that of *C. fischeri* except that the columella plications are much stronger and continue across the parietal surface. The shell is pure creamy white and lacks any spiral ornamentation, and is small at 9 - 10 mm in length.

Remarks. Cossignani (2006) separated *C. sabellii* from the closely related *C. fischeri* on the grounds of its consistently smaller size (he was comparing it with Palawan specimens of *C. fischeri*), the lack of any colour pattern, the strength of the columella plications, and the limited range. Despite these differences, these two species bear a strong resemblance to each other.
Bunjamin Dharma kindly provided several lots of small *Cryptospira* from northern Borneo localities for study. These were separable into typical *C. sabellii* (W:L ratio 62 - 63 %) and a very small, pale and thin morph bearing spiral lines, which are herein regarded as the Borneo form of *C. fischeri* (W:L ratio 59 - 60 %) [see remarks under that species]. As they appear to be distinct in the material studied, I cautiously regard *C. sabelli* and *C. fischeri* to be separate species.

Cryptospira immersa (Reeve, 1865)

Figs 53 - 57, 66, 67, 82

Marginella immersa Reeve, 1865 (Jan.) xv, pl. xxi, fig. 109.
Cryptospira quiquandoni Cossignani, 2006. (April), 51: 5. 6.

Type material. Locality not given, 1 spm, 13.4 x 8.2 mm, holotype, ex - Mrs. J. Lombe-Taylor coll., (Figs 53, 82), BM(NH) Reg. No. 1874.12.11.87.

Other material. On the tablet which bears the holotype of *M. onychina*, the right hand one of the three shells present is a specimen which compares extremely closely with the holotype of *C. immersa* and measures 12.9 x 8.1 mm.
Balabac Is., south Palawan, Philippines, 11 spm, 14.3 x 9.1 mm, 14.4 x 8.9 mm, 14.5 x 8.9 mm, 14.5 x 8.9 mm (Fig. 57), 14.9 x 9.0 mm (Fig. 56), 15.0 x 9.0 mm, 15.0 x 9.0 mm, 15.0 x 9.0 mm, 15.0 x 9.1 mm, 15.0 x 9.2 mm, 15.3 x 9.4 mm, AWC.
Philippines, Palawan, Balabac Is: Holotype of *C. quiquandoni,* 15.18 mm (Fig. 54), MMP; Paratype 1 of *C. quiquandoni,* 14.97 mm (Fig. 55), TCC.
Philippines, Palawan, South Balabac. Three specimens dived in 10-30m, 14.6 x 8.9 mm, 14.2 x 8.6 mm, 14.0 x 9.0 mm, deposited as voucher material. BM(NH) Reg. no. 20100325.

Type locality. Not given.

Distribution. Currently only known from Balabac Is., South Palawan.

Descriptive notes. Shell small (L = 13-15 mm, W:L = 61-64%), thin, rounded sub-triangilar, inflated posteriorly, tapering smoothly to base of columella. Colour pale cream to pale pinkish, with weakly evident axial growth line markings. Lip white. Four very weak narrow spiral lines of darker colour evident, absent in very pale specimens; first at level of or just posterior to fourth plication, second at the level of the sixth plication, third halfway between the second spiral line and posterior labial insertion, and the fourth, often almost completely obscured, at the suture. Spire of 3.5 whorls including protoconch, flat or weakly elevated, protoconch raised, suture glazed over. Shoulder smooth, rounded. Aperture straight, evenly narrow, as wide as labial varix, flaring slightly anteriorly. Lip thickened externallyas a single varix with a smooth rolled edge. Denticles absent, external varix groove present. Siphonal notch absent, posterior notch moderately strong. Lip extending to level of highest point of spireand inserting just onto the spire, causing the posterior end of the lip to kink over at a sharp angle before its insertion point, thinning out as it does so. Columella with six strong evenly placed plications occupying 2/3 of the aperture; the first two close together and oblique, the third to fifth more horizontal, strongest and flat edged, the sixth weaker and finer but not remote from the fifth. Anterior ventral callus merging laterally with the external varix and medially with the distal ends of the first four plications. Anterior end rounded. Parietal surface posterior to plications is smooth, callus absent to weak.

Remarks. The short original description of this species is as follows; 'Shell somewhat pyriformly-ovate, bluish white, spire small, immersed, whorls timidly rounded at the upper part, lip callusly

reflected, columella strongly five-plaited.' Rather unhelpfully, Reeve also comments that '*it is difficult to convey an accurate notion of this species, either by figure or description, but it is clearly distinct to the eye.*' The challenge therefore is to be more objective in our observations in order to establish the true identity of this species.
'New Caledonia' has been annotated in an unknown hand to the board to which the holotype was attached, but at a later time than it was mounted and described. This Pacific island locality is remote from the Sunda Shelf distribution of all of the other members of the genus. As it is not possible for the same genus to evolve independently in two geographic locations (Wallace, 1855) and since numerous MNHN expeditions have been performed in New Caledonia at both deep and shallow levels without finding this species, I regard this annotation as erroneous.
The data with the holotype also states that a second specimen from the tablet has been removed to the general collection at the NHM. There are two specimens labelled *C. immersa* in the main collection at the NHM, but neither appears to be this 'second' specimen. The first is the right hand shell on the tablet to which is mounted the type specimen of *C. onychina* and the second is a specimen from the Sykes collection, not previously mounted to a tablet, and is clearly a specimen of *C. tricincta*.
Despite the rarity of antiquarian records of the species, examples of *C. immersa* are now widely available. Cossignani (2006) brought it to the attention of collectors when he described it as a new species, *C. quiquandoni*, and again it is one of the exciting finds from the Balabac Strait between Borneo and Palawan. The size and morphology of most fresh specimens of *C. quiquandoni* (W:L ratio 60 - 63 %) match the holotype of *C. immersa* (W:L ratio 61.1 %) very well indeed. They also share the same wide, flattened and closely spaced columella plications, and the slightly elevated protoconch (note; the original figure and holotype are at odds with the description and the name given to the species in that the spire has a raised protoconch and is therefore not immersed!). The pattern of axial striations is present in both, and the spiral lines faintly present in *C. quiquandoni* would have originally been present in the now faded specimens of *C. immersa*. I am of the opinion that *C. quiquandoni* Cossignani, 2006 is conspecific with *C. immersa* (Reeve, 1865) and therefore the latter should be adopted as the correct specific name.
The close relationship between *C. onychina* and *C. immersa* is obvious to the eye. The latter however, is a consistently smaller species and there is no size overlap. *C. onychina* has a more elongate and more smoothly tapering shell (W:L ratio 55.2%-61%), the posterior end of the lip is more pronounced and the spire, including the protoconch, is flat or immersed, unlike the slightly raised spire of *C. immersa*. Its colour is also greenish-grey compared to the pale pinkish *C. immersa*.

Cryptospira onychina (A. Adams & Reeve, 1848)
Figs 58 - 61, 80, 82, 83

Marginella onychina A. Adams & Reeve, 1848. Voy. Samarang. Moll., p. 29, pl. x, fig. 25

Type material. Three shells mounted to a tablet are collectively the syntypes, BM(NH) Reg. No. 20100333. The figured syntype is the specimen on the left, 21.05 x 13.1 mm (Fig. 58). Labels: on reverse, original label states '*M. onychina* Adams & Reeve, Types, China Seas'. On front, '*bernardii*, Largilliert' as an annotation. [Note; Middle specimen is a juv. *C. onychina* 18.5 x 10.9mm, right specimen is *C. immersa* 12.9 x 8.1mm].

Other material. South China Sea, 1 spm, 22.9 x 13.1 mm (Fig. 59), BM(NH).
Balabac Is., south Palawan, Philippines, 6 spm., 16 x 9.5 mm, 16 x 9.5 mm, 16.5 x 9.7 mm, 16.5 x 10 mm, 17.1 x 10.2 mm, 17.7 x 10.3 mm, AWC.
Balabac Is., south Palawan, Philippines, dived in 15 - 20 m, 7 spm, 18.0 x 10.0 mm, 18.0 x 10.5 mm, 18.5 x 10.9 mm, 18.8 x 10.9 mm, 19.0 x 11.0 mm (Fig. 61), 20.0 x 10.75 mm (Fig. 60), 20.0 x 11.5 mm, AWC.
Balabac, south Palawan, Philippines, 3 ad spm, 16.2 x 9.8 mm, 16.0 x 9.4 mm, 16.6 x 9.7 mm, deposited as voucher material, BM(NH) Reg. No. 20100330.

Type locality. 'South China Sea', without further precision.

Distribution. Currently only known from the Balabac Strait and the Sulu Sea coast of Palawan Is.

Habitat. Muddy sand in 15-20 m.

Descriptive notes. Shell medium sized (L = 18-23 mm, W:L ratio 55.2% - 61%), cylindrical-ovate, pale cream to greyish-brown. Purplish-brown axial lines weakly decorate the body whorl along growth lines. The spire is flat to involute, the shoulder smooth and rounded. The lip is straight for the most part, extending beyond apical level but with a sudden arch posteriorly to insert to callus at the side of the spire. The aperture is narrow, flaring only slightly anteriorly. The columella has six plications morphologically comparable with *C. tricincta*, occupying the anterior 2/3 of the aperture. All are flat topped and moderately strong with the exception of the sixth plication which is weak and fine. Three spiral lines are visible on the body whorl – very faint in the holotype but easily distinguished in live taken specimens; first just posterior to the fourth plication, the second just anterior to the sixth plication, and the third mid way between the second spiral line and the labial insertion. Anterior ventral callus merges laterally with the external varix and medially with the distal ends of the first four plications. Anterior end is rounded. Parietal surface posterior to plications is smooth, callus absent to weak

Remarks. The original description makes note of the elongated aperture and depressed, almost hidden spire which are important features of this species. The figure of *Marginella onychina* (Fig. 84) in the original description by A. Adams & Reeve (1848) is accurate and unambiguously depicts the type specimen (Fig. 58). However, sixteen years later in the Marginella Monograph in Conchologia Iconica (1864/5), Reeve presented less accurate illustrations (made by G.B. Sowerby) of this type specimen (Figs 86, 87), and chose to name it *Marginella Bernardii* Largilliert, 1845, listing his own *M. onychina* as a synonym. In fact, on the tablet to which the type of *M. onychina* is mounted, '*bernardii*, Larg. China Seas, M.C.' is annotated in Reeve's own handwriting. The name M. (or C.) *Bernardii* continued to be used for this species by subsequent reviewers such as Redfield (1870), Tomlin (1917), & Clover (1979), but only Jousseaume (1875) noticed the error. He drew attention to the fact that Largilliert's original description and figure of *M. Bernardii* are very different from those of *M. onychina*. He observed that the spire of *M. onychina* was depressed and hidden whereas that of *M. Bernardii* was prominent and visible and that the issue was so clear-cut for him that other differences did not need to be pointed out! For the sake of clarity, I will expand further. The original figure of *M. Bernardii* (Figs 91, 92) are accurate drawings which clearly show the khaki coloured shell to have a finely zigzagging axial pattern, relatively oblique columellar plications and a morphology highly suggestive of a small specimen of the *C. elegans* group species *C. strigata* (Dillwyn, 1817). The description is also detailed and mentions the denticulate inner labial border – a character entirely restricted to the *Cryptospira elegans* group. Although the type specimen of *M. Bernardii* has not been traced, photographs of specimens matching the description can be seen in Dharma (2005, p. 150, figs. 15a & c) which illustrate the point perfectly.

In their description of *Marginella onychina*, Adams and Reeve commented that '*this species might be readily confounded with Marginella tricincta, but it differs materially in form, being more depressed and rounded at the hinder extremity, with the spire buried as in the cowries, and less swollen in the middle. The streaky character of the painting is also characteristic.*' With regard to this last comment, the material of this species present in the BM(NH) is dead collected and worn. It is well known that erosion of the surface nacre in some species enhances the underlying pattern, and *C. onychina* is no exception. The axial lines are much less obvious in live specimens, but are visible nevertheless.

Until recently there were only four specimens of *C. onychina* available for study; the holotype, one adult and one juvenile specimen in the BM(NH) collection and the specimen depicted by Clover (1979, fig. 3) which he referred to as *C. bernardii*. All are worn, dead collected shells labelled 'South China Sea'.

Figures 39-64. *Cryptospira fischeri* group.

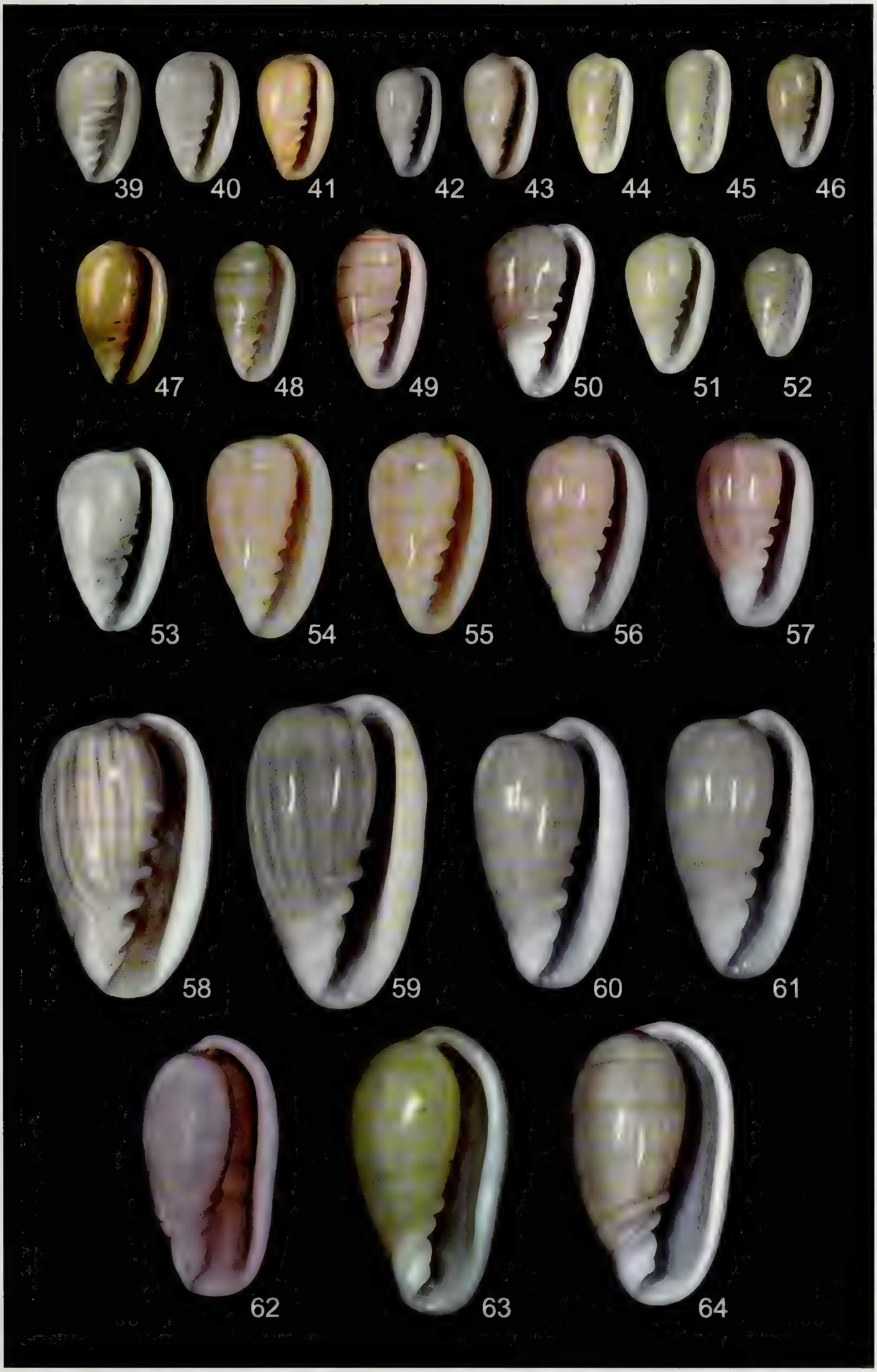
39-41. ***Cryptospira sabellii*** Cossignani, 2006
39. Holotype, 9.72 mm, Borneo, 01° 42.44' N 108° 22.92' E, 48 m , MMP; **40.** Paratype 1, 9.97 mm, Borneo, 01° 42.44' N 108° 22.92' E, 48 m, TCC; **41.** Pejantan, north Borneo, 9.0 mm, AWC.

42-52. ***Cryptospira fischeri*** Bavay, 1902
42. Thailand, Ranong, 8.0 mm, AWC; **43.** Northern Borneo, Subi Is., 9.0 mm, AWC; **44.** Palawan, 11.08 x 5.87 mm, AWC; **45.** Palawan, 10.1 x 5.92 mm, AWC; **46.** Palawan, 9.85 x 5.85 mm, AWC; **47.** Syntype, MNHN, 10.3 x 6.0 mm, locality unknown; **48.** 10.29 x 5.89 mm
49. Philippines, 11.8 mm (photo courtesy Marcus Coltro); **50.** Palawan, 12.78 x 7.98 mm, AWC; **51.** Palawan, 10.9 x 6.75 mm, AWC; **52.** Palawan, 9.86 x 6.18 mm, AWC.

53-57. ***Cryptospira immersa*** Reeve, 1865
53. Holotype, 13.4 x 8.2 mm, BM(NH) Reg. No. 1874.12.11.87; **54.** Holotype of *C. quiquandoni* Cossignani, 2006, Philippines, Palawan, Balabac Is., 15.1 mm, MMM ; **55.** Paratype 1 of *C. quiquandoni* Cossignani, 2006, 14.9 mm, Philippines, south Palawan, Balabac Is., TCC; **56.** Philippines, south Palawan, Balabac Is., 14.9 x 9.0 mm, AWC; **57.** Philippines, south Palawan, Balabac Is., 14.5 x 8.9 mm, AWC.

58-61. ***Cryptospira onychina*** A. Adams & Reeve, 1848
58. Holotype, BM(NH) Reg. no. 20100333, 21.05 x 13.1 mm, 'China Seas'; **59.** South China Sea, 22.9 x 13.1 mm, BM(NH); **60.** Philippines, south Palawan, Balabac Is., 20.0 x 11.5 mm, AWC; **61.** Philippines, south Palawan, Balabac Is., 19.0 x 11.5 mm, AWC.

62-64. ***Cryptospira quadrilineata*** Gaskoin, 1849
62. Holotype of *M. quadrilineata* Reeve, 1864, 18.8 x 10.3 mm, BM(NH) Reg. no. 1874.12.11.76; **63.** Philippines, Palawan, 21.0 mm (photo courtesy Alistair Moncur); **64.** Philippines, Palawan, 21.0 mm, AWC.


39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64

Recently though, many fresh specimens of this species have been discovered in Balabac, Palawan. The main character differences from *C. tricincta* are that although the posterior end of the lip extends beyond the apex of the shell, it inserts well to the side of the spire, rather than directly on top of it. This creates a more cylindrical body whorl and shoulder which is more tightly rounded compared to the sweeping posterior end of the lip of *C. tricincta*. Specimens currently in circulation are often labelled incorrectly as *C. fischeri*, presumably due to the colour and the spiral lines which are common to both. *C. fischeri*, however, has an elevated spire, not an immersed one and it does not attain such a large size. The old museum specimens are a little larger than the new records and have a stronger axial pattern, though this is considerably enhanced by erosion. They are therefore probably from a different population, but nevertheless appear to be conspecific.

(iii) *Cryptospira quadrilineata* sub-group.

Cryptospira quadrilineata Gaskoin, 1849
Figs 62 - 64, 72, 130

Cryptospira quadrilineata Gaskoin, 1849 (Dec. 14), p. 17
Marginella quadrilineata Reeve, 1864

Type material. No locality (ex. voyage Samarang, J. Lombe-Taylor coll.), 1 spm, 18.8 x 10.3 mm, holotype of *Marginella quadrilineata* Reeve, 1864, BM(NH) Reg. No. 1874.12.11.76, (Fig. 62).

Other material examined. No locality, 2 juv. spms, 17.3 mm & 14.4 mm, & 1 spm, 24.4 x 14.9 mm, all on a tablet, ex. Mus. Cuming, BM(NH).
No Locality, 1 spm, 23.7 x 14.7 mm, AWC.
Balabac, Palawan, Philippines, 5 ad. spm, 21.0 - 23.0 mm, (Fig. 63, 64), AWC.

Type locality. Unknown.

Distribution. Clover (1979), states that it is trawled in 80 m off southern Palawan and on into Borneo.

Habitat. 20 - 80 m on muddy sand.

Descriptive notes. Shell medium sized (L = 18 - 24 mm, W:L = 55 %), thin, light, oval to sub-pyriform, inflated. Colour pale greyish to light brown with occasional growth lines. Lip white. Four very narrow, sharply defined red-brown spiral lines on body whorl; All four evenly spaced across parietal surface from just below the labial insertion to just above the fourth plication. Spire involute, buried directly under callus cap at the labial insertion. Shoulder smooth, very rounded. Posteriorly, aperture slightly wider than labial varix, flaring noticeably anteriorly to 3-4 times the width of the varix. Lip thickened externally as a single varix with a smooth rolled edge. Internal aspect of lip smooth, lacking denticles. External varix groove present. Anterior and posterior notches absent. Lip extending beyond apex, curving round to insert into callus pad directly over apex of spire. Columella with four moderately strong, thin-edged plications, set in the anterior 1/3 of the aperture; First two oblique, close together then fusing distally, columella deeply excavated between second and third plications. Third and fourth plications oblique. Parietal surface smooth from fourth plication to labial insertion, and anterior ventral callus wash merges medially with the distal ends of the first three plications.

Remarks. Until relatively recently this species was known only from material in old collections, and possibly exclusively from examples brought back to England on H.M.S. Samarang. It is now relatively easy to source fresh specimens of this species from southern Palawan. Gaskoin's original description is very thorough and requires little additional comment for this instantly recognizable species, apart from the variability in the profile of the shell, which has become apparent from studying non-type material and the illustration in Clover (1979). Apparently Reeve was unaware that this species had been described by Gaskoin, because in *Conchologica Iconica* he described it as a new species whilst coincidentally using the same specific epithet as Gaskoin!
With a W:L ratio of 60 - 60.4%, the shell morphology varies from inflated (Fig. 64), to slightly pyriform (Fig. 63), to narrow and sub-cylindrical (Fig. 62). The four fine spiral lines, wide aperture, light shell, immersed spire and smooth labrum would seem to place this species firmly in the *Cryptospira tricincta* group. However, the columella is very concave and the first and second plications are distally fused. These characters represent such a significant departure from the normal columella morphology of the group, that the presence of a mono-specific sub-group within it is a distinct possiblility.

(B) *CRYPTOSPIRA VENTRICOSA* GROUP

The *Cryptospira ventricosa* group is the smallest of the three species groups within the genus. It comprises three extant and one fossil species; *C. ventricosa* (G. Fischer, 1807), C. *dactylus* (Lamarck, 1822), *C. trailii* (Reeve, 1865) and the now extinct *C. sangiranensis* Martin, 1906. The principal characteristics of the *Cryptospira ventricosa* group are :

- A truncated columella base and anterior end of the lip.
- In lateral view, the entrance to the anterior (siphonal) canal is in-line with the columella axis (Figs 122-124). In the *elegans* and *tricincta* groups it is oriented downwards by 30° (Figs 119-121).

- Lip strongly thickened internally except at the posterior end where it thins and appears to flare forming a deep and wide posterior notch and a strong shoulder. Labial denticles absent, although both the inner lip and external margin are often irregularly callused giving a non-uniform surface.
- Five columellar plications. First plication thin, close to second, long, angled at base to form truncation and shallow anterior notch. Second to fifth plications strong, equidistant. Weak to very strong elongated parietal lira posterior to fifth plication. This begins just within the aperture, and extends across the parietal surface. It is always much longer than the plications. A short denticle between fourth and fifth plications is uncommonly seen (Fig. 114). Plications + lira + denticle occupying 2/3 of apertural length.
- Wide and callused columella base extending to ends of of first four plications, often extending as a pad onto side of shell. Pad of callus on parietal surface opposite posterior labial insertion serves to further define and deepen the posterior notch.
- spire usually moderately elevated, occasionally high or nearly flat.
- size 7-45 mm.
- solid grey or tan colour with no banding pattern. Axial ornamentation restricted to parallel growth lines, and surface defects caused by mantle injury during shell formation.

Distribution. The geographical distribution of the group is essentially the distribution of the nominate species and it occupies a central position in the overall range of the genus. The group is recorded from Vietnam down to Singapore and the Strait's of Malacca, north and east Sumatra, the north coast of Java, to Lombok and eastern Kalimantan (see Fig. 7). On the western side of the Malaysian peninsula, recent records show that the distribution extends as far north as Satun Province in southern Thailand (S. Patamakanthin pers. comm.). Jousseaume (1875) went further, giving the distribution as extending into the Bay of Bengal, but recent records do not corroborate this. It is the confusion between *C. ventricosa* and two members of the *Cryptospira elegans* group, *C. glauca* and *C. marchii*, which has caused these identification problems and introduced errors in recorded range distributions. Even Coomans (1969) who drew attention to the differences between *C. ventricosa* and *C. glauca* was unable to completely rectify the situation because he too made errors in the identification of *C. glauca* (see later discussion on that species). *Cryptospira ventricosa* (as *M. quinqueplicata* Lamarck, 1822) was one of 18 marginellids listed as part of the fauna of the mollusca of the Persian Gulf, Gulf of Oman and Arabian Sea by Melvill & Standen (1901), but again, this is in error as *Cryptospira* does not range that far West. After morphological comparison of large numbers of specimens, the differences in shell morphology between *C. ventricosa* and species in other groups are quite clear and are demonstrated herein.

Taxonomic aspects. *C. ventricosa* (G. Fischer, 1807) has a chequered taxonomic history. It is arguably the most commonly encountered large marginellid species in 19th Century European museum collections, where specimens are frequently labelled *Marginella quinqueplicata* Lamarck, 1822. The holotype of *M. quinqueplicata* (Fig. 105) is clearly a specimen of *C. ventricosa* and is already established as a junior synonym of it (Tomlin, 1917), as are the highly callused *Marginella Hainesii* Petit, 1851 and the eroded *Marginella vermiculata* Redfield, 1851. *M. Hainesii* is represented by 2 syntypes in the Collection du Journal de Conchyliologie (MNHN). The figured type is the larger of the two (Figs 103, 104). There are two specimens labelled *M. Hainesii*, with no data, in the Saul Collection (CMZ) and it is also present in the BM(NH) collection. All of these shells appear to be merely heavy, worn, highly callused specimens, which have been shown to fall within the variability range of *C. ventricosa* by Dharma & Dunlap (1994). *M. vermiculata* has no taxonomic value as it was proposed in a privately printed catalogue, and Redfield later withdrew it (1870, Amer. Journ. Conch. vi, 254). This shell is now no. 29063 in Coll. Redfield, ANSP. None of these taxa were published with locality data. All of these extra names are testament to the fact that Fischer's taxon, as rightful name-bearer of the species, was poorly known by the *Marginella* workers of the time. Neither Weinkauff, Tryon or Redfield mentioned the name in their monographs. Perhaps this was not surprising, since the description of *C. ventricosa* was but a brief entry in the 1807 catalogue of the Paul Demidoff collection (Zoological Museum of the University of Moscow) and was limited to two lines of text with no locality data, no measurements and no figure to support it. Copies of this catalogue did not appear to be freely available in the research libraries of the major institutions. Jousseaume (1875) went as far as to list the places where he had searched for, and failed, to find it. He was eventually provided with the description of *M. ventricosa* by Professor Deshayes, which translated from the original French text reads; 'humped marginella, blueish, pot-bellied, very short spire, the columella has five plaits, lip strongly rolled, smooth.' Sufficiently enlightened by this brief but surprisingly accurate description, Jousseaume (1875) was the first to suggest that it was the same species as *M. quinqueplicata*. Tomlin (1917) followed Jousseaume, listing *M. ventricosa* as valid and declaring that 'the name *ventricosa* supersedes *quinqueplicata*'. This confirmation that Fischer's taxon should be the name-bearer of the species is now generally accepted and universally used.

Dubious Taxa. *Voluta porcellana* Perry, 1811 was regarded as a synonym of *M. ventricosa* by Tomlin

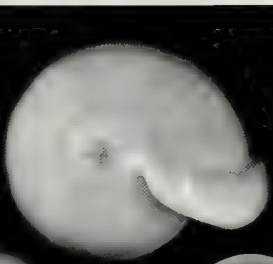
(1917), but it had previously been included in the synonymy of both *M. strigata* Dillwyn, 1817 by Redfield (1870) and *M. elegans*, Gmelin, 1791 by Tryon (1882-83). More recently Coomans (1969) also included it in the synonymy of *M. elegans*. Tomlin noted: "The colourization of the figure is probably fantastic and certainly unrecognizable. The description points to *ventricosa* and the five strong plaits in the figure are exactly as in *ventricosa*." With a few exceptions, Perry's work is largely discredited due to the fanciful nature of the figures and this explains why it was completely ignored by all the other major 19th century *Marginella* workers. The pattern on his figure of *Voluta porcellana* (Fig. 89) is indeed unusual and the columella plications are not accurately depicted. There are historical clues as to the whereabouts of the specimen illustrated. Dance (1986) mentions how Perry used some of H.C. Jennings (1731-1819) shells for his book. The Jennings collection in part was purchased at auction in 1816 by W.J. Broderip, and the Broderip collection is now in the BM(NH). However, a search of the *Marginella* and *Voluta* collections at the BM(NH) was unsuccessful in rediscovering this shell. Taking all the factors into account, *V. porcellana* Perry should continue to be considered as a *nomen dubium*.

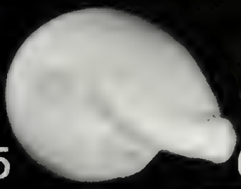
There is, however, a further twist to the tale. *Marginella odoriyci* Bernardi, 1852, was described from a single worn specimen originally in the Dinan Museum (France) but now lost (Tomlin, 1917 and subsequent enquiry by the author). It was considered to be a valid species by all the 19th century reviewers and also by Tomlin (1917) but it was Jousseaume (1875) who suggested that due to its five plications it was probably a *Cryptospira*. Weinkauff (1879) figured the shell (Figs 93, 94). The pattern of 'jumping figures' bears a remarkable similarity to the pattern on the figure of *Voluta porcellana*, and although it cannot be proven, the fact that they may have been the same species needs to be considered. The shell has an elevated spire (too high for *Cryptospira*) and is rather small (18 x 11 mm) for most specimens of axially patterned *Cryptospira* such as *C. elegans* and *C. strigata*. The original description also mentions that the aperture is an orange colour, and the body whorl is white with broad yellow bands which are axially strigate with orange brown, again not seen in *Cryptospira*. Its morphology, I believe, is far more suggestive of the genus *Prunum*, yet the columella undeniably has five plications. The *Prunum/Volvarina* complex generally have four columellar plications, but there are a few exceptions, including a small complex of species centred around *Prunum fulminata* Kiener, 1841 which have five plications, a strong wavy axial pattern and are the right size. It is possible therefore that *M. odoriyci* and maybe also *V. porcellana* are this species or one closely related to it. No further deductions can be made about either taxa until the holotypes are rediscovered and examined and attempts are currently underway to do just that. For the time being therefore, both taxa should be removed from consideration in the genus *Cryptospira*.

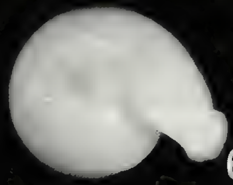
Figures 65-94.

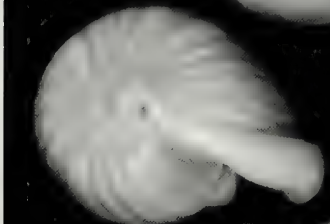
65-76. Spire morphologies.
65. *C. tricincta* Hinds, 1844, Taiwan, AWC; **66.** *C. immersa* Reeve, 1865, Holotype, NHM; **67.** *C. immersa* Reeve, 1865, Palawan, Balabac Is., AWC; **68.** *C. onychina* A. Adams & Reeve, 1848, Holotype, NHM; **69.** *C. fischeri* Bavay, 1902, Palawan, AWC; **70.** *C. sabellii* Cossignani, 2006, Pejantan, N. Borneo, AWC; **71.** *C. onychina* A. Adams & Reeve, 1848, NHM; **72.** *C. quadrilineata* Gaskoin, 1849, Palawan, AWC; **73.** *C. tricincta* Hinds, 1844, Palawan, AWC; **74.** *C. onychina* A. Adams & Reeve, 1848, Palawan, AWC; **75.** *C. wallacei* n. sp., Makassar, Pulau Balabalangan; **76.** *C. dactylus* Lamarck, 1822, Pontianak, West Kalimantan.

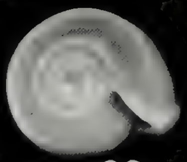
77-94. Miscellaneous illustrations
77-78. *Marginella tricincta* Hinds, 1844, first figure from Hinds 1844b; **79-80.** *Marginella (Cryptospira) ovalis* Marrat, original figure; **81.** *Marginella fischeri* Bavay, 1902, original figure; **82.** *Marginella immersa* Reeve, 1865, original figure; **83.** *Cryptospira glauca* Jousseaume, 1875, original figure; **84.** *Marginella onychina* A. Adams & Reeve, 1848, original figure; **85.** *Marginella ventricosa,* live animal (after Souleyet, 1852); **86-87.** Figures of *Marginella onychina*, incorrectly named as *Marginella Bernardii* Largilliert, 1845, in Reeve, 1864/5; **88.** *Marginella loebbeckeana* Weinkauff, 1878, original figure; **89.** *Voluta porcellana* Perry, 1811, original figure; **90.** *Marginella trailii* Reeve, 1864, original figure; **91-92.** *Marginella Bernardii* Largilliert, 1845, original figures; **93-94.** *Marginella odoriyci* Bernardi, 1852, figures from Weinkauff, 1879.

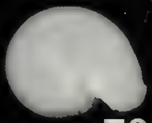

65

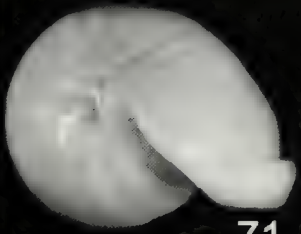

66

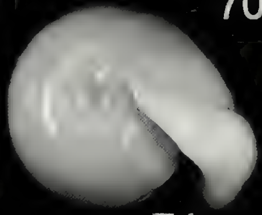

67

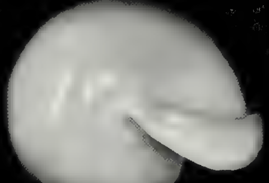

68

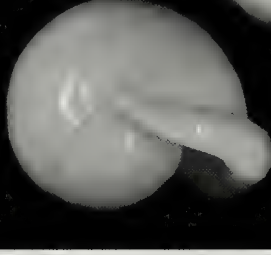

69

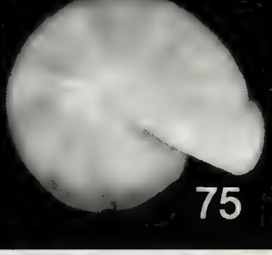

70

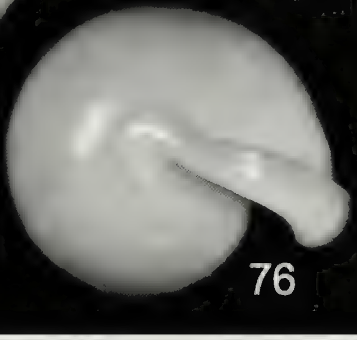

71

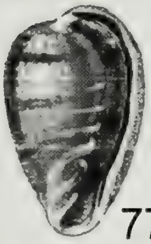

74

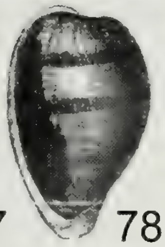

73

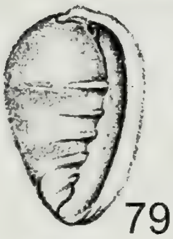

72

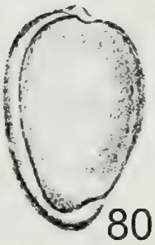

75

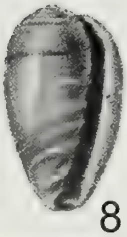

76

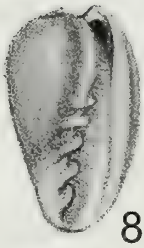

77

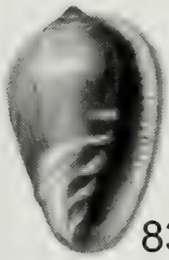

78

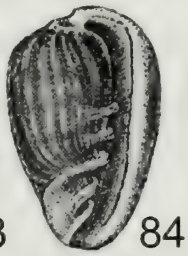

79

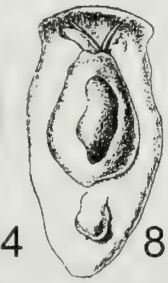

80

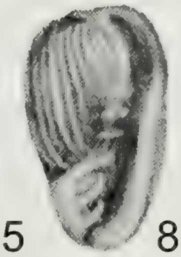

81

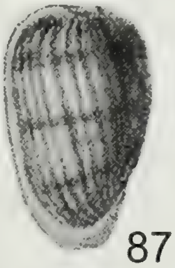

82

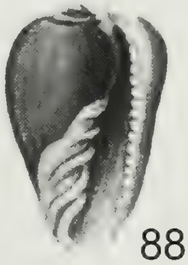

83

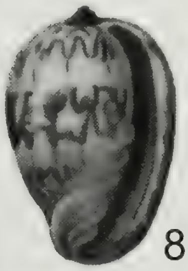

84

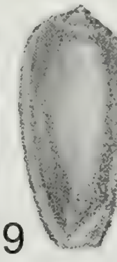

85

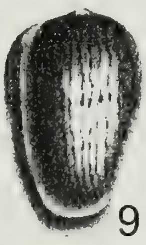

86

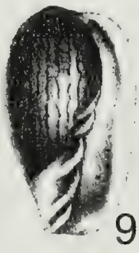

87

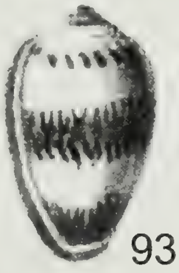

88

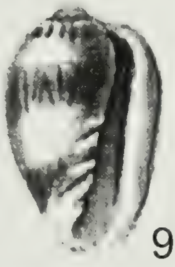

89


90


91


92


93


94

Persistent identification problems.

Whilst the synonymy is established and the correct name for the species is now accepted as being beyond reasonable doubt, there remains considerable taxonomic confusion between the typical *C. ventricosa* and another species, *C. glauca* Jousseaume, 1875. Jousseaume showed that he had a good working knowledge of these species because in his Marginella monograph of 1875 he remarked how *C. ventricosa* (as *M. quinqueplicata* and *M. Hainesii*) differed from *M. glauca*. However, later authors were unable to grasp the morphological distinction between the two, including Tomlin (1917) who regarded *C. glauca* as "rather doubtfully distinct from *ventricosa*", and Wagner & Abbott (1967) who noted that *M. glauca* "may be *ventricosa*".

Coomans (1969) was well aware of the confusion between *C. glauca* and *C. ventricosa* and dealt with it comprehensively in a comparative review of the two species utilising the material available to him in the ZMA. He also designated a type locality for the species based upon the provenance of the material he was studying, safe in the knowledge that "the type of *M. ventricosa* is kept in the Zoological Museum of the University of Moscow, being a part of the collection Demidoff from which it was described by G. Fischer". However, according to a paper on the molluscan type specimens of the Museum Demidoff Collection (Ivanov, Kantor, Sysoev & Egorov, 1991) the type of *C. ventricosa* was in fact lost before 1872, and most probably earlier than that during the 1812 war. The current curator has, upon my request, checked the collection again and confirms that the type is indeed lost. Perhaps Coomans would have designated a neotype in addition to a type locality for this species had he been aware that his pronouncement about the existence of the type specimen was erroneous. However, the original description and the clarification by Coomans of what exactly constitutes this species are probably sufficient to avoid the need to now designate a neotype (Article 75, ICZN).

So is the morphology of *C. ventricosa* understood any better by researchers and authors today? Evidence of continued confusion is not hard to find. The shell photograph issued on card No 75 (Kaicher, 1973) of *C. ventricosa* is in fact *C. marchii*. Cossignani (2006, p. 322) correctly identified the depicted specimens as *C. ventricosa*, yet on p. 292 he repeated Kaichers error by incorrectly identifying the specimens of *C. marchii* (top row, centre) and *C. glauca* (the remaining images of *Cryptospira* on that page) as *C. ventricosa*. Finally, any search of shell websites with marginellid content will reveal photographs of specimens of *C. glauca* identified as *C. ventricosa*, and vice versa. It is clear therefore, that there is still considerable misunderstanding over the morphology of all of these species. A comparison of the key features of the *ventricosa* group with the remaining two groups is required to deal with this confusion once and for all.

Usage of species group characteristics in solving species identification problems.

The confusion in the literature between *C. ventricosa* and *C. glauca* is compounded by the fact that several species are commonly referred to as *C. glauca*. Fortunately, the two primary diagnostic characters of the *ventricosa* group enable straightforward separation of *C. ventricosa* from these other species (Figs 119-124). A principal diagnostic difference lies in the morphology of the first plication. All of these species, including *C. ventricosa*, have a thin first plication when compared with the remaining four, but in the *ventricosa* group this plication extends further then sharply angles back forming the truncated anterior end of the shell. In the *elegans* group this angle is absent and instead the first plication sweeps back in an elegant curve forming a more rounded anterior profile. This also has an effect upon the orientation of the siphonal canal, which is best observed laterally, from the opposite side to the lip. In the *ventricosa* group the siphonal canal is in line with or turns slightly upwards (dorsally) away from the columella axis and the truncated anterior end lies at a right angle to it (Figs 122-124). In the *elegans* group the siphonal canal inclines noticeably downwards (ventrally) and the anterior end of the shell forms an acute angle to the columella axis (Figs 119-121). This will always reliably separate *C. ventricosa*, *C. dactylus*, *C. trailii* and *C. sangiranensis* from other species. The orientation of the siphonal canal towards/away from the substrate may have a functional significance in relation to the position occupied by the animal in or on it, but this will only be ascertained by direct observation of the animal.

C. dactylus, though undoubtedly possessing the anterior end primary shell characters of the *Cryptospira ventricosa* group, resembles the morphology of *Cryptospira tricincta* at its posterior end and this is considered to be a convergent character.

Cryptospira ventricosa (G. Fischer von Waldheim, 1807)

Figs 85, 95 - 107, 114, 122, 125, 258, 259

Marginella ventricosa G. Fischer von Waldheim, 1807. Mus. Demidoff, iii, p. 172
Marginella quinqueplicata Lamarck, 1822
Marginella vermiculata Redfield, 1851
Marginella Hainesii Petit, 1851
Marginella ventricosa Hedley, 1903 (non-*Marginella ventricosa* G. Fischer, 1807)
? *Voluta porcellana* Perry, 1811 (*nomen dubium*)
† *Marginella ventricosa* var. *minor*, Martin 1895

Type material. Holotype of *Marginella ventricosa* G. Fischer, 1807 stated as lost from Demidoff collection, ZMUM (Ivanov, Kantor, Sysoev & Egorov, 1991). *Marginella quinqueplicata* Lamarck, 1822. holotype MHNG Reg No. 1103.44, 31.8 x 20.8 mm (Fig. 105).

Marginella Hainesii Petit, 1851, syntype, 24.3 mm, MNHN (Figs 103, 104).

Other material. Na Trang, Vietnam: 2 spm, 19.1 mm & 23.25 mm, FBC; 4 spm, 38.0 x 24 mm (Fig. 101), 35.6 x 23.1 mm, 35.5 x 21.5 mm, 30.5 x 20.5 mm, AWC.
'Malacca': 3 spm on tablet, 8 fathoms, coarse gravel, 36.0 x 23.3 mm, 30.6 x 20.0 mm, 37.2 x 23.55 mm, BM(NH), (Fig. 102). [Note: this shell, the largest, was figured in Reeve's Conch Icon. Pl. X f. 40a, b].
Singapore: 1 spm, 33.5 x 21.4 mm, AWC (Figs. 99, 100); 2 spm, ex. C.T. Trenchman coll., 33.0 x 21.9 mm, 32.2 x 22.5 mm, BM(NH); 6 spm, ex. Miss Archer coll., 22-34.5 mm, BM(NH).
West Malaysia, Pulau Pangkor, Pres. R.D. Purchon, 26.2 mm, BM(NH).
Karang Hantu, Banten, West Java, 2 spm, in 5-10 m, 28.0 x 18.3 mm, 23.8 x 15.7 mm, AWC.
Karang Hantu, Banten, West Java, growth series; in 0.5 m, 17.3 mm, 21.9 mm, 23.5 mm, AWC, (Fig. 107).
Brebes, central Java, 5 spm, dredged by fisherman in 5-10 m, 24.1 - 25.2 mm, AWC.
Indramaya, Java, 6 spm, in fishermans net, 31 - 38.5 mm, AWC (Figs 95-97).
Jakarta Bay, West Java, in fishermans net, 25.7 x 17.0 mm, AWC.
Kepulauan, Seribu, Java, 2 spm, 27.1 mm & 27.3 mm, FBC.
Bali, 3 spm, 30 - 32.3 mm, FBC.
Santubong, Sarawak, washed up among rocks on shore of muddy sand at river mouth, coll. D.G. Reid, 1 spm, 24.4 x 14.9 mm, BM(NH).
Singkep Is., eastern Sumatra, dredged in 20 metres, 33.2 x 19.3 mm, AWC (Fig. 98).
La N'gu Bay, Satun Province, Southern Thailand (Andaman Sea), dredged in 5 - 10 m, 3 spm, 38.0 mm, 38.0 mm, 37.8 mm, SPC.

Type locality. Designated as Surabaya, north coast of Java (Coomans, 1969).

Distribution. Vietnam to Singapore and the Strait of Malacca, north and east Sumatra, the north coast of Java, to Lombok and eastern Kalimantan.

Habitat. Mud, sand and gravel substrates in 10-30 m. Has been recorded in an estuarine environment (Dharma & Dunlap, 1994) and in fine muddy sand in 10 metres off mangroves in Satun Province, Thailand (pers. comm. S. Patamakanthin).

Descriptive notes. Shell medium to large (L = 25 - 45 mm, W:L = 56-72 %), thick, heavy, pyriform to ovate, inflated posteriorly, tapering to truncated base. Colour even bluish pale grey, with sparse axial growth markings. Lip opaque white, thick to very thick. Spire exposed, low to elevated with a raised crest at the suture, of 3.5 whorls including protoconch. Shoulder rounded, smooth. Labial shoulder forming a sharp right angle with the lip. Posteriorly, aperture as wide as labial varix, widening to 1.5 times as wide anteriorly. Lip thickened as a single varix with a smooth rolled edge. Internal aspect of lip smooth. External varix groove present. Anterior and posterior notches present. Lip extending to level of suture, but generally below the apex, inserting into callus on the body whorl just beow the surture. Columella with five plications; all oblique, strong. An elongated denticle resembling a remote 6th plication extends horizontally across parietal surface further than the plications. Posterior ventral callus opposite labial insertion present, resulting in a well demarcated posterior notch. Anterior ventral callus widening columella base and forming a fasciole which merges with the first three plications, its edge well defined between the third and fourth plications.

Remarks. The shell, from 25 - 45 mm in length matures according to the growth series presented in fig. 107. The truncated base is present throughout development, the last adult whorl often develops a raised crest at the suture, and the lip matures by increasing its internal thickness except at the posterior end where it forms the extended and angulate posterior shoulder.
The animal of *C. ventricosa* was reported upon by Coovert (1987) who referred to an illustration of it in Souleyet (1852). The animal is uniformly coloured, with a rather large siphon. The mantle extends from all sides, covering spire with the central area uncovered. The foot has a large bulbous protuberance posteriomedially. Souleyet's drawing was subsequently reproduced by Tryon (1882-83, Pl. 9, fig 64). Tryon's figure is shown here (Fig. 85).
Dharma & Dunlap (1994) reported that heavily callused shells are found at Tembilahan, Sumatra, in the region of the estuary of the Indragiri River, and also in many localities in Java where shells of this species are generally thicker and fatter than they are in Sumatra. Slender shells have been found in 20 – 30 metres near Singkep Is., east Sumatra (Fig. 98), but all are clearly identifiable as *C. ventricosa* due to the columella morphology, truncated anterior end, colour, and sub-pyriform to pyriform profile.

Cryptospira dactylus (Lamarck, 1822)
Figs 76, 108, 109, 254 - 257

Marginella dactylus Lamarck, 1822. Anim Sans Vert., vii, 360
† *Marginella dactylus* var. *inflata* Martin, 1895.
† *Marginella dactylus* var. *minor* Pannekoek, 1936.

Type material. 1 spm, holotype, MHNG Reg. No. 1103/53, 23.9 x 14.3 mm (Fig. 108).

Other material examined. Makassar Strait, 00°58'S 119°29'E, dredged in 62 m, CORINDON Exped., st. DR254, 1 spm, 26.3 x 12.2 mm, MNHN.
Makassar Strait, 01°11'S 117°06'E, trawled in 21 m, CORINDON Exped., st. CH201, 1 spm, 21.0 x 9.6 mm, MNHN.
Makassar Strait, 01°08'S 117°18'E, trawled in 49 m, CORINDON Exped., st. CH205, 7 spm, 30 x 13.5 mm, 27.5 x 12.4 mm, 27.0 x 12.3 mm, 29.3 x 13.4 mm, 23.0 x 10.0 mm, 25.0 x 11.0 mm, 25.2 x 11.0 mm, & 2 juv. spm, 32.6 x 14.2 mm, 15.1 x 6.1 mm, MNHN.
East Sumatra, Bangka Is., trawled in 10 m, 1 spm, 19.0 x 8.5 mm, AWC.
Sunda Strait, Fisherman's net in 20 m, 1 spm, 21.0 x 9.4 mm, AWC.
Java, Surabaya, 1 spm, 32 mm, FBC.
Java, Madura Strait, 2 spm, 37 mm & 37 mm, TMC.
West Kalimantan, Pontianak, trawled in 25-30 m, 1 spm, 33.5 x 15.9 mm (Fig. 109), AWC.
West Malaysia, Johor, 1 spm, 34 mm, AWC.
Lombok Island, 2 ad spm, 36.8 x 17.8 mm, 33.7 x 16.3 mm, AWC.

Type locality. Unknown.

Distribution. Reliably recorded from West Malaysia, east into the Java Sea including the Karimata, Makassar, and Sunda Straits, but populations appear to be fragmented in their distribution. A large population exists in Lombok. The range may extend north into the South China Sea; some old museum specimens state Hong Kong as their locality, but this requires confirmation.

Habitat. From 8 to 62 m on muddy substrates.

Descriptive notes. Shell medium to large (L = 21 - 37 mm, W:L = 46 - 48 %), moderately thin, light, elongate and sub-cylindrical, narrow posteriorly, tapering slightly to truncated base. Colour pale bluish-grey. Lip white. Pattern absent. Spire immersed, concealed under apical callus. Shoulder smooth, rounded. Aperture evenly narrow and straight, widening to 1.5 times the width of the labial varix anteriorly. Lip thickened slightly as a single varix with a smooth rolled edge. Internal aspect of lip smooth, lacking denticles. External varix groove present. Anterior notch weak, posterior notch absent. Lip extending beyond end of shell curving round to insert into callus directly over apex. Columella with five oblique plications; first slightly sinuous, second and third strongest, then weakening to fifth. Anterior ventral callus with distinct, slightly raised edge between third and fourth plications. Anterior end somewhat truncated, parietal surface posterior to plications is smooth and parietal callus is absent.

Remarks. The characteristically elongate cylindrical shape, with its five anteriorly positioned, evenly oblique columellar plications, consistent shell morphology (W:L ratio 45% - 47.7%) and solid grey colour lacking any spiral pattern make the identification of this graceful species quite straightforward, and it is hard to see how it could be confused with anything else. Its group is, however, not intuitive. The immersed spire and the arching of the posterior labial insertion onto the spire are characters converging upon those of the *Cryptospira tricincta* group, but the lack of any spiral pattern, the position of the columellar plications, the truncated base, the angulation of the anterior canal, and the range of distribution place this species firmly in the *Cryptospira ventricosa* group. It has an interesting fossil record, but the extinction of one of its fossil forms and its sporadic occurrence in the recent could imply that this elegant species may be on the decline.

Cryptospira trailii (Reeve, 1865)

Figs 110 - 113, 115 - 118, 124

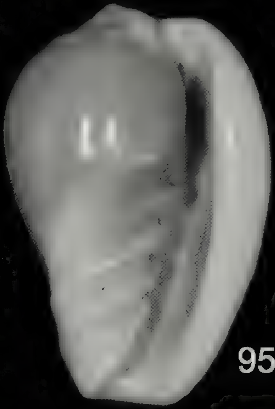
Marginella trailii Reeve, 1865 (5th Jan.) Conch. Icon., xv, pl. xxi, fig. 114.

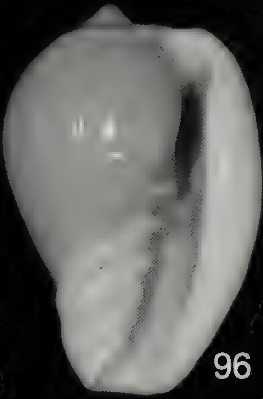
Type material. Malacca, 2 spm, syntypes, Reg. No. 1975011/012, 13.4 x 6.6 mm (Figs 110, 111), 12.9 x 6.5 mm (Figs 112, 113), BM(NH). [Note: the larger of the two is the figured specimen in Reeve].

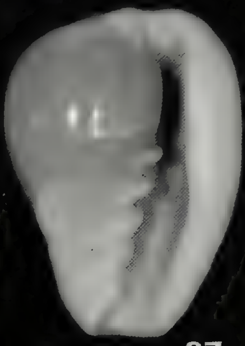
Figures 95-109. *Cryptospira ventricosa* group.

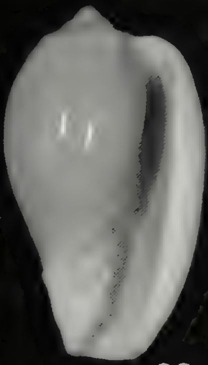
95-107. ***C. ventricosa*** Fischer von Waldheim, 1807
95-97. Indramaya, Java Sea, 36.7 x 24.5 mm, 36.8 x 24.5 mm, 31.0 x 22.4 mm, AWC; **98.** Singkep Is., Sumatra, 33.2 x 19.3 mm, AWC; **99-100.** Singapore. 33.5 x 21.4 mm, AWC; **101.** Nha Trang, Vietnam, 38.0 x 24.0 mm, AWC; **102.** Malacca, 37.2 x 23.55 mm, BM(NH) (Shell depicted by Reeve, 1864); **103-104.** Syntype of *M. Hainesii*, Jousseaume, 1875, 24.3 mm, MNHN; **105.** Holotype of *M. quinqueplicata*, Lamarck, 1822, 31.8 x 20.8 mm, MHNG. Reg. No. 1103.44; **106.** Spire view showing posterior notch and internal labial callus; **107.** Growth series, Karang Hantu, Banten, west Java, 17.3 mm, 21.9 mm, 23.5 mm, AWC;

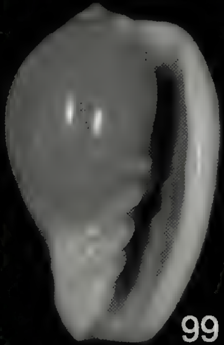
108-109. ***Cryptospira dactylus*** Lamarck, 1822
108. Holotype, MHNG Reg. no. 1103/53, 23.9 x 14.3 mm; **109.** West Kalimantan, Pontianak, 33.5 x 15.9 mm, 25-30 m, AWC.

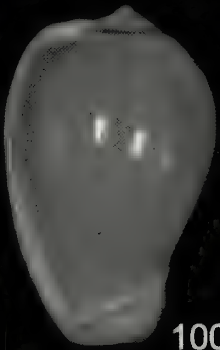

95

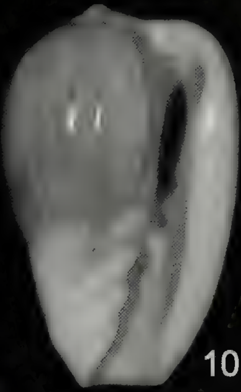

96

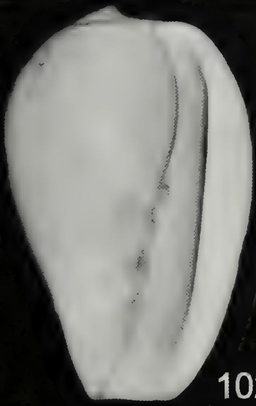

97

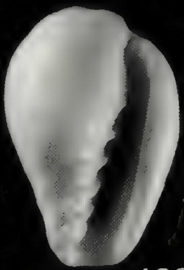

98

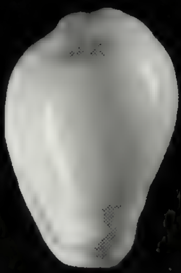

99

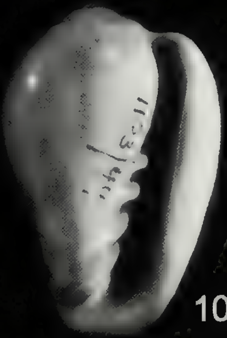

100


101

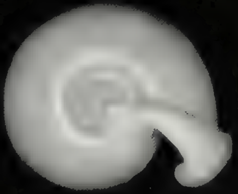

102

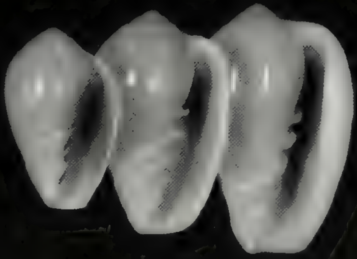

103

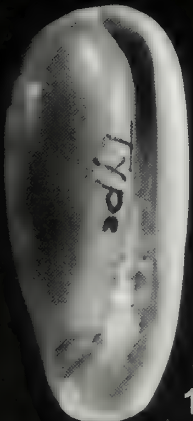

104



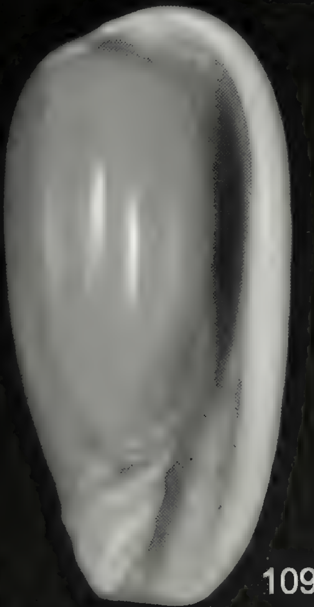
105


106


107



108


109

Other material. 2 spm, 10.77 x 5.28 mm, 11.45 x 5.46 mm, Singkep Is. East Sumatra, 20 m, collected June 1992, AWC (Figs 115 - 118, 124).
Several further specimens with same data in BDC.

Type locality. 'Malacca'

Distribution. Strait of Malacca to Singkep Is, Sumatra.

Habitat. Muddy sand at about 20 m.

Descriptive notes. Shell small (L = 11-13.4mm, W:L 49-50%), moderately thin, elongate, narrow posteriorly, tapering smoothly to truncated base of columella. Colour pale straw or cream, without axial or spiral pattern. Lip same colour as body whorl. Spire elevated, 3.5 whorls including protoconch. Shoulder smoothly rounded, labial shoulder forming a right-angle with the lip. Aperture straight, as wide as labial varix in posterior half, flaring to twice this size anteriorly. Lip thickened externally as a single varix with a smooth edge. Lip smooth, denticles absent. External varix groove present. Anterior notch present, posterior notch absent. Labial insertion at shoulder. Columella with five oblique, square-crested plications occupying anterior 2/3 of the aperture; first and second plications closest and most oblique. Anterior ventral callus merging with distal ends of first three plications.

Remarks. This is perhaps the most elusive species of the genus, and as such it is poorly known. Until specimens were recently collected at Singkep Island, Sumatra, the only other known examples were the two syntypes in the BM(NH). The species is very distinctive, with its elevated spire, elongate, sub-rectangular shape, straight, thick labial margin and an almost right-angled labial shoulder creating a strong posterior notch.

(C) *CRYPTOSPIRA ELEGANS* GROUP

The *Cryptospira elegans* group comprises an aggregation of 6 species with characteristic combinations of shell morphologies and colour patterns. It is the dominant group in the western arm of the geographical distribution of the genus. Its valid species are; *C. elegans* (Gmelin, 1791), *C. strigata* (Dillwyn, 1817), *C. marchii* Jousseaume, 1875, *C. praecallosa* (Higgins, 1876), *C. glauca* Jousseaume, 1875, *C. grisea* (Jousseaume, 1875), *C. scripta* (Hinds, 1844) and *C. bridgettae* n. sp.
C. elegans and *C. strigata* together have the longest lists of synonyms in the whole family and despite clear differences, have at various times also been included in the synonymy of each other. Most of the group's species are common and familiar to conchologists because of their relatively large sizes and the colourful patterns of their shells, but *C. scripta* and *C. grisea* remain rather rare in collections, and *C. bridgettae* n. sp. is only known from limited type material.

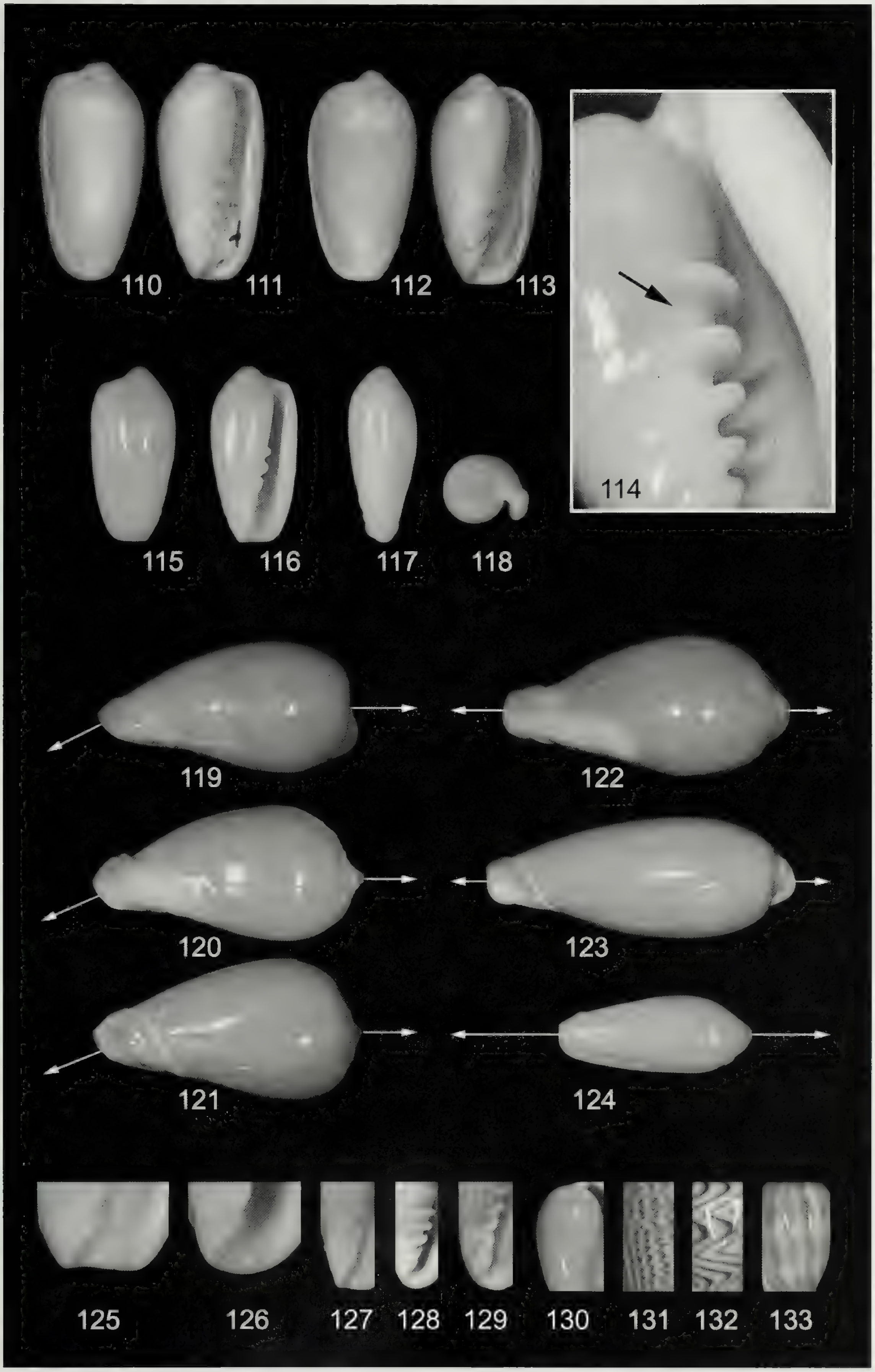
Figures 110-133. *Cryptospira ventricosa* group and shell characters.

110-113, 115-118. *Cryptospira trailii* Reeve, 1865

110-111. Syntype figured by Reeve, Malacca, 13.4 x 6.6 mm, BM(NH) Reg. No. 1975011; **112-113.** Syntype, Malacca, 12.9 x 6.5 mm, BM(NH) Reg. No. 1975012; **115-118.** Singkep Is., Sumatra, 11.4 x 5.4 mm, AWC.

119-124. Orientation of the siphonal canal.
119. *C. tricincta* Hinds, 1844, Palawan (*Cryptospira tricincta group*); **120.** *C. glauca* Jousseaume, 1875, Madras (*Cryptospira elegans* group); **121.** *C. marchii* Jousseaume, 1875, Andaman Sea (*Cryptospira elegans* group); **122.** *C. ventricosa*, Fischer, 1807, (*Cryptospira ventricosa* group); **123.** *C. dactylus*, Lamarck, 1822, (*Cryptospira ventricosa* group); **124.** *C. trailli*, Reeve, 1865, (*Cryptospira ventricosa* group).

114, 125-133. Shell characters
114. Detail of columella of *C. ventricosa* showing denticle between 4th and 5th plication; **125.** truncated anterior end of *C. ventricosa*; **126.** rounded anterior end of *C. tricincta*; **127.** anterior end and ventral callus of *C. dactylus*; **128.** columella of *C. tricincta* with relatively horizontal plications; **129.** columella of *C. strigata* with relatively oblique plications; **130.** Fine spiral lined pattern seen in *Cryptospira tricincta* group species (*C. quadrilineata* shown); **131.** Finely zig-zagged axial lined pattern of some *Cryptospira elegans* group species (*C. strigata* shown); **132.** Strongly zig-zagged pattern of some *Cryptospira elegans* group species (*C. scripta* shown); **133.** Smooth axial pattern along growth lines, seen in *Cryptospira tricincta* group species (*C. wallacei* shown).


110
111
112
113
114
115
116
117
118
119
122
120
123
121
124
125
126
127
128
129
130
131
132
133

Principal characteristics of the *Cryptospira elegans* group

The *C. elegans* group is the only *Cryptospira* group having member species which bear well-formed denticles on the inner aspect of the labial margin and this can be said to be one of its two primary shell characters. Having said that, some species, for example *C. glauca*, are always heavily denticulate whereas they are very weak to absent in specimens of other species such as *C. elegans*, so care has to be exercised when applying this shell character during identifications. Although heavier denticulation often goes hand in hand with increasing shell maturity, this is not always the case. Within populations of normally denticulate species, for example *C. strigata*, there will also be mature specimens with denticles so reduced that they are hardly detectable. The '*elegans*' group can always be differentiated from the '*ventricosa*' group by the angle the anterior end of the shell makes with the horizontal plane in lateral view (see figs 119-124). With the exception of fluctuations in base colour as a result of growth lines, no other group exhibits an axial pattern. It consists of well developed fine zig-zags in *C. elegans* and in most specimens of *C.strigata*, and it is so well developed in *C. scripta* that it forms an elaborate and striking pattern. However, axial pattern is absent in *C. glauca*, *C. grisea* and in some varieties of *C. strigata*. Such inconsistencies in individual shell characters make diagnosis of *Cryptopira elegans* group species reliant upon primary and secondary character combinations. The principal shell characters of the elegans group are therefore as follows:

- Lip smooth to denticulate (up to 30 elongated denticles). Deeply denticulate callus bevel often present at posterior end of internal aspect of lip (Fig. 159).
- Axial pattern of irregular wavy lines to zig-zags, often heavily disrupted (Fig. 154). Production of darker pigment at specific zones along the growing edge of the shell creates repeating axial micro-patterns which result in a macroscopic spiral pattern effect (Figs 139-146).
- Shell sizes from very small (5 mm) to very large (50 mm) for the family.
- Shells ovate, ob-ovate, elongate-ovate, and subtriangular in profile.
- Colour of labial margin often concentrated at the marginal groove. Ground colour varies from pale grey and pale cream to bluish-grey and greenish-brown.
- Five strong columellar plications. First two plications as in other groups of *Cryptospira*, are very close together.
- Weak to moderate anterior ventral callus which extends to between the third and fourth plication, often well demarcated by a ridge extending from between these two plications, round to join up with the edge of the varix adjacent to the varix groove.
- Weak to moderate parietal callus extending from the level of the posterior end of the lip is often present.
- Spire exposed and flat to slightly elevated. Protoconch always visible.

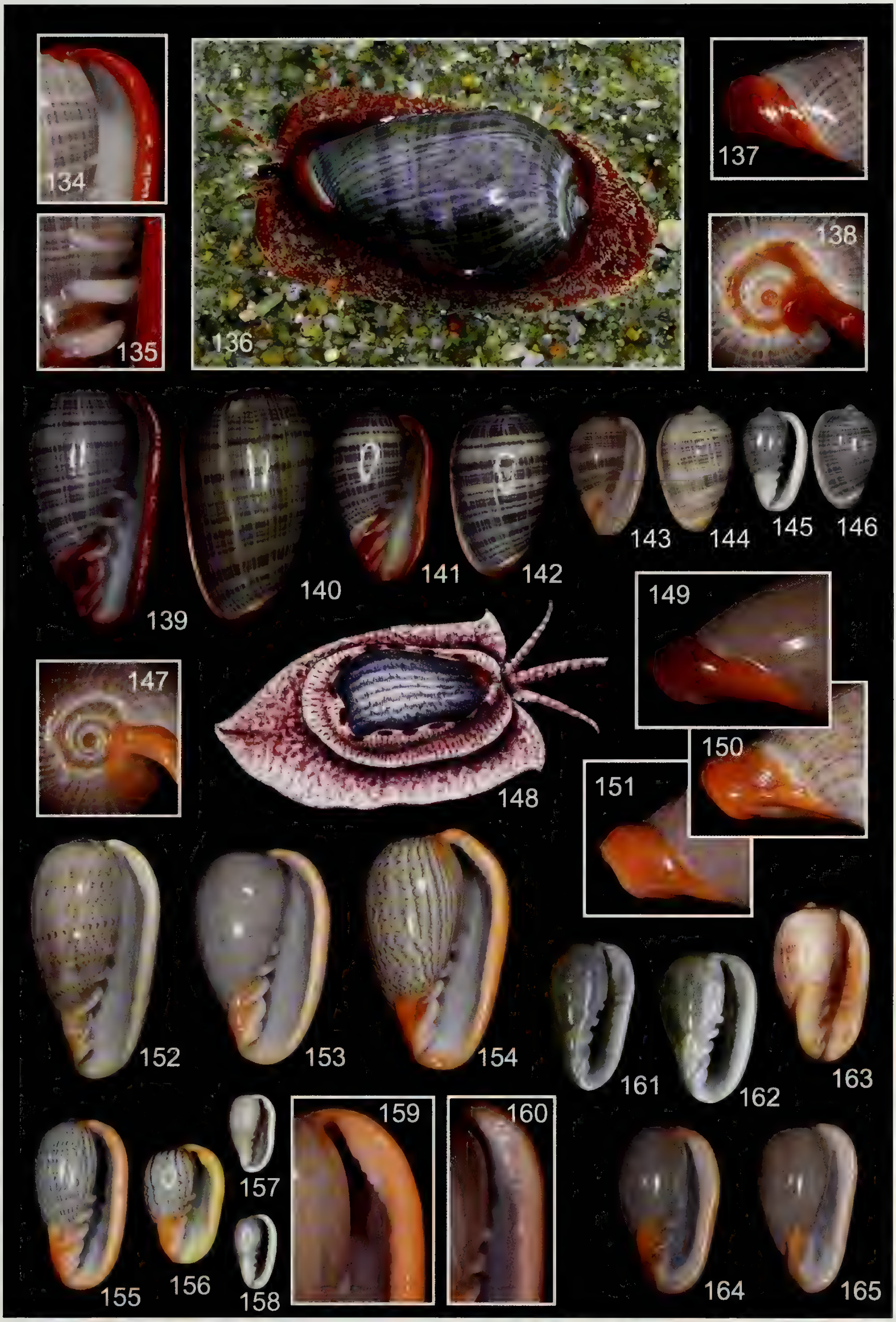
Figures 134-165. *Cryptospira elegans* group.

134-144. *Cryptospira elegans* Gmelin, 1791;
134. Posterior end of lip; **135.** 4th & 5th plications and parietal lira; **136.** Live animal, low tide, Laemson National Park, Ranong Province, Thailand; **137.** Anterior callus; **138.** Spire; **139-140.** Andaman Sea, dredged 60 m. 49.0 x 28.0 mm, AWC; **141-142.** Andaman Sea, 33.0 x 20.0 mm, AWC; **143-144.** Racha Island, Phuket, Thailand, 25.0 x 16.0 mm, AWC.

145-146. *Cryptospira bridgettae* n. sp., Bang-Rin to Nang Yon, Ranong Province, S. Thailand, holotype, 20.05 x 12.58 mm, BM(NH) Reg. no. 20100327

147-148, 150-159. *Cryptospira strigata* Dillwyn, 1817;
147. Spire; **148.** *M. undulata* Deshayes, illustration from Adams & Reeve, 1848; **150-151.** Anterior callus morphologies; **152.** Strait of Malacca, narrow form, 46.0 x 25.0 mm, AWC;
153. Andaman Sea, dredged 60 m, the var. 'unicolor', 44.0 x 26.0 mm, AWC; **154.** Andaman Sea, 49.0 x 28.5 mm.(= *Marginella undulata* of Deshayes),AWC; **155.** Strait of Malacca, 33.0 x 18.5 mm, AWC; **156.** Rawa Bay, low tide on sand, 23.0 x 15.5 mm, AWC; **157.** Singkep, E. Sumatra, 16.0 x 9.0 mm, AWC; **158.** Bay of Bengal, 14.3 mm, FBC; **159.** Denticulated bevel at posterior end of lip.

161-165, 149. *M. praecallosa* Higgins, 1876;
161-162. *M. loebbeckeana* Weinkauff, 1878, holotype, 29.8 x 19.0 mm, LMD;
163. Holotype, 25.0 x 12.0 mm, MCM; **164.** Andaman, Sea, 34.0 x 21.0 mm, AWC; **165.** Andaman Sea, 33.5 x 20.0 mm, AWC; **149.** Anterior callus formation in *M. praecallosa*.


134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165

Distribution Pattern. The distribution of the *elegans* group is the most distinctive of all the three groups in the genus. It is the sole occupant of the western arm of the range of distribution of the genus (see Fig. 8). It extends from western Borneo, eastern Sumatra (Karimata Strait) and the southern end of the Straits of Malacca, Malaysia (2 *elegans* group species), passes up into the Andaman Sea between the Nicobar and Andaman Islands and Thailand then north to Burmese waters (4 *elegans* group species), and then into the Bay of Bengal and down the east coast of India to Sri Lanka (1 *elegans* group species). The only overlap of the *C. elegans* group distribution with *Cryptospira* species from other groups is from the Northern end of the Malacca strait to the Karimata Strait and southern Kalimantan. The type locality of *C. scripta* is 'Macassar', so theoretically the overlap could extend further East to the Wallace line. It should be noted however that all other records of *C. scripta* are from Malacca or the Andaman Islands.

Taxonomic aspects. There are three unresolved taxonomic issues to address in this group;

1. To clarify the morphologic species definition of *C. glauca* Jousseaume, 1875: Several grey-coloured species from across the range of distribution of the group, and involving a wide range of morphologies, are currently being referred to as *C. glauca*.

2. To reveal the correct taxonomic placement of *C. loebbeckeana* (Weinkauff, 1878) by examination of the type specimen: *C. loebbeckeana* is frequently and confusingly used as a varietal name for specimens of *C. glauca* from the Bay of Bengal (eastern coast of India).

3. To reconsider the taxonomic position of phena currently considered synonymous with *C. strigata* in the literature: *M. undulata* Chemnitz, 1788, *M. Burchardi* Reeve, 1864, *M. marchii* Jousseaume, 1875, and *M. Bernardii* Largilliert, 1845

The true identity of *C. glauca* Jousseaume, 1875

To properly define *C. glauca* we need to consider the original description, study the type specimen and make comparisons with the morphologies of superficially similar grey '*Cryptospira elegans*' group species. In addition, an understanding of the distribution of the various phenotypes occurring in the Bay of Bengal and the Andaman Sea is absolutely essential.

In his monograph of the Marginellidae, Jousseaume (1875) provided a very detailed description of *C. glauca*, including an accurate, exquisitely drawn colour figure, with remarks about how the species differed from *M. quinqueplicata* Lamarck, 1822 and *M. hainesii* Petit, 1851 (both presented earlier as synonyms of *C. ventricosa* G. Fischer von Waldheim, 1807). Jousseaume therefore left us in no doubt about its morphology. All specimens have a heavily denticulate lip and a moderate to strong basal callus (Fig. 172) giving shells a stout, subtriangular to ovoid appearance (Figs 166-177). It is important to note that it was described without a type locality, but that Coomans (1969) designated it as being Singapore. The description and original figure of *C. glauca* clearly indicate a basally callused shell of the type exclusively found in the western Bay of Bengal, from Sri Lanka northwards up the east coast of India. The syntype (Figs 170, 171) was rediscovered in the Jousseaume collection (MNHN) by Dr. E. Fischer-Piette at the request of Coomans in 1969, and its morphology is in accordance with the observations made above. The length of the syntype is 24 mm and the size range of the many specimens I have studied is from 21-28 mm, with most specimens being around 24 mm in length. Similarly coloured shells (Figs 180-198) sourced from the Mergui Archipelago (Burma) and further south along the coast of Thailand and peninsular Malaysia through the Straits of Malacca down to Singapore and northeast Sumatra could not be more different, in that in even very mature adult specimens the basal callus is always absent (Fig. 185), and the shells often attain a larger size (though there is an overlap with the size range of *C. glauca*). Because the basal callus is a constant shell character in *C. glauca*, we should regard it as important in defining the species, and by default the shells with no basal callus found further east need to be regarded as a separate species (see below). When considered in this way, *C. glauca* is easy to identify in terms of size, shape and distribution. It is also necessary to re-designate the type locality of Singapore, designated by Coomans (1969). The majority of specimens I have seen are sourced from Chennai (Madras), and so the type locality of *C. glauca* is hereby redesignated as Chennai, Tamilnadu, India.

The true identity of *C. loebbeckeana* (Weinkauff, 1878)

Three years after Jousseaume's description of *C. glauca*, *M. loebbeckeana* Weinkauff, 1878 was described. Tomlin (1917) stated that it was 'rather doubtfully distinct from *ventricosa*, G. Fischer' but nevertheless he listed it as a valid species. It was considered to be a synonym of *C. glauca* by Coomans (1969), and has been commonly used as a varietal name for that species ever since ('*C. glauca var. loebbeckeana* '). Weinkauff's figures of the dorsal and ventral views lack detail, and in his descriptive text he gives the size as 31 x 19 mm (W:L ratio of 61%). He was of the opinion that the *M. elegans* specimen figured in Sowerby (1846, fig. 149), was the same as his species, and that *M. Burchardi* Reeve was also a synonym. Clearly, a very confused state of affairs.

In 1969, Coomans was denied access to the type lot of *M. loebbeckeana* due to lack of curatorial presence at the Loebbecke Museum, Dusseldorf. Today, we are more fortunate because the museum now has a curator, and excellent photographs of the type specimen taken from several angles have been secured (Figs 161, 162). These were compared and contrasted with the syntype of *C. glauca* (Figs 170, 171), in order to check Coomans' assignation. The clear differences in the size and shape of the shells indicate that they are not, in fact, the same species. This comes as no real surprise because Weinkauff gave the measurements of the type of *M. loebbeckeana* as 31 x 19 mm and as noted earlier I have not seen any example of the true *C. glauca* over 28mm. Coomans (1969) did not spot this of course, because he included the larger, uncallused, more eastern ranging species (here called *C. marchii*) in his definition of *C. glauca*.

Apart from the size difference, when making a comparison between *C. loebbeckeana* and *C. glauca,* the morphology of the lip should be regarded as a particularly important character because in these species comparison of the basal callus is not diagnostic – it is strongly present in both. When viewed from the ventral aspect, the internal labial surface of *C. glauca* is straighter than that of *M. loebbeckeana.* In cross section, *C. glauca* has a more rounded denticulate labial border with denticles relatively close to the edge, whereas in *M. loebbeckeana* the denticles are present on a raised ridge more deeply situated in the aperture. This is demonstrated in cut-away sections (Figs 178, 179).

M. loebbeckeana also has consistently different labial morphology to *C. strigata.* Along the entire length of the inner lip, it has a very strong, curved, sloping surface, bearing moderately strong lirae which terminate as raised denticles along a crest which runs the entire length of this sloped surface (Fig. 160). In contrast *C. strigata* has a deeply denticulate sloping bevel at the posterior insertion of the lip only (Fig. 159). *M. loebbeckeana* is a good match morphologically with the slightly more callused *M. praecallosa* Higgins, 1876 (Fig. 163) and it is considered herein to be a synonym of it. We have the benefit of a recently collected lot of shells from a population in the straits of Malacca to compare with the types of *M. loebbeckeana* and *M. praecallosa* and these consistently demonstrate the diagnostic labial morphology. In conclusion, *M. loebbeckeana* is not a synonym or a variety of *C. glauca* as stated by Coomans (1969), and because it was described later it becomes a a junior synonym of the valid *M. praecallosa* Higgins.

The taxonomic position of phena closely allied to *C. strigata*

From Burma down to southern Thailand (and probably further into the Straits of Malacca), populations of medium-sized, very weakly denticulate, uniformly pale grey shells are found (Figs 180 - 198). As noted above these are often erroneously referred to as *C. glauca*, possibly because they were lumped together with that species by Coomans (1969). [Note; The largest of the ten specimens Coomans used for his study was a 31.5 mm long shell from Sumatra - clearly not *C. glauca* on account of both its size and its provenance]. They are also much more variable in size and shape than the relatively morphologically constant *C. glauca*. The lack of taxonomic clarity with this species has come about because within its range of completely intergrading morphologies are subtriangular shells superficially resembling *C. glauca*, and ob-ovate shells resembling *C. strigata.* Unlike *C. strigata* or *C. glauca* however, the basal callus is limited to a fine wash and the labial denticulation is much reduced or absent, The edge of the ventral callus wash is clearly marked by a prominent ridge emerging from between the 3rd and 4th plications and continuing around the base of the shell to link up with the edge of the labial margin at the marginal groove. I have had the good fortune of obtaining a substantial lot of thirty unsorted specimens, sourced from La N'gu, Satun Province, southern Thailand, in which the full range of their morphological variability is expressed. Firstly, it was possible to separate out two quite typical *C. strigata* of similar size by the presence of a denticulate bevel at the inner aspect of the posterior end of the lip. The remaining morphologies are presented in figs 180-185, 187-191, and 193-198. When the whole range of morphologies are familiarized and compared with the type material of relevant taxa, namely *M. Burchardi* Reeve, 1864 and *M. marchii* Jousseaume, 1875, we find that both fit in the range of morphologies at different points. The three syntypes of *M. Burchardi* (one shown in Fig. 186) are in the BM(NH) and their morphology is a close match for ob-ovate specimens from the population sample from La N'gu, Thailand (Fig. 187). The morphology is very close to *C. strigata* and that they are small, faded examples of this species was declared by Redfield (1870) and Tomlin (1917). Jousseaume pointed out that the name *M. Burchardi* was preoccupied and he renamed it *M. marchii* Jousseaume, 1875. The syntype (Fig. 192) is in MNHN. *C. marchii* is a much smaller and lighter shell than *M. Burchardi* but still falls within the range of normal variation of the species as noted above. As I cautiously consider this species to be distinct from *C. strigata*, and completely distinct from *C. glauca*, *C. marchii* Jousseaume, 1875 is designated here as being the correct name for this species, with *M. Burchardi* Reeve 1864 being synonymous.

There are two other taxa which need to be considered in relation to *C. strigata* ; *M. Bernardii* Largilliert, 1845 and *M. undulata* Deshayes, 1844. *M. Bernardii* has been the name given to Taiwanese *C. cloveriana* by some recent authors. Earlier in this paper this assignment was shown to be erroneous, the rightful place of *M. Bernardii* being in the synonymy of *C. strigata*. *M. undulata* is simply a *C. strigata* with a particularly clear wavy axial pattern (Fig. 154).

Adams and Reeve (1848) collected and recorded the living animal of *C. strigata*, referring to it as *M. undulata* Deshayes (Fig. 148). The animal was particularly well illustrated and described thus; 'This fine species was also taken alive, the tentacles, siphon foot and mantle are of a delicate, semitransparent yellowish ground colour, streaked and mottled with carmine, the border of the mantle being mildly spotted with the same. The left lobe of the mantle is more produced over the shell than the right.' The animal of *C. strigata* is clearly paler and more of the yellowish colour is evident than in the animal of *C. elegans* (Fig. 136).

Cryptospira elegans (Gmelin, 1791)
Figs 134 -144

Lister, Conch., 1688. Pl. 803, Fig. 11.
Martini, Conch., 1773. i, p. 106, pl. 42, Fig. 424, 425.
Voluta No. 98, Schroeter, 1786. Einleitung, i, 269.
Murex monilis, 1787. Meusch., Mus. Gevers., p. 328, No. 713.
Voluta elegans Gmelin, 1791. Ed. Syst. Nat., p. 3448.
Voluta cancellata var., 1793. Schreibers, Conchylien-Kentnniss, i, p. 118. (nomen dubium)
Voluta elegans, in Wood, 1828, Index Testac., pl. 20, Fig. 69 (copied from Martini).
Marginella elegans, in Kiener, 1834. Coq. Viv., p. 15, pl. 8, Fig. 35.
Marginella bullata, in Reichenbach, 1842, Conch., p. 62, pl. 37, Figs 530, 531.
Marginella elegans, in Reeve, 1843, Conch. Systemat. Ii, 249, pl. 277, Figs 5, 6 ; Catlow, 1843, Pop. Conchology, p. 251 ; Deshayes, 1844, ed. Lam. Anim. Sans Vert. X, p. 450 ; Sowerby, 1846, Thes. Conch., i, p. 385, pl. 77, Fig. 147 (not 148, 149); Chenu, 1859, Manuel de Conchyl., i, p. 199, Fig. 1056 ; Reeve, 1864, Conch Icon., *Marginella*, pl. 2, Figs 4a, b ; Redfield, 1870, Catalogue Fam. Marginellidae, p. 231, no. 52 ; Tryon, 1882-83, Man. Conch., Fam. Marginellidae, p. 30, pl. 9, Figs 67-70, 82; pl. 2, Fig. 8.

Type material. Not found.

Other material. W. Malaya, trawled off Pulau Pangkor, 2 spm., 31.0 mm & 26.0 mm; trawled off Pulau Langkawi, 2 spm., 32.0 mm & 32.5 mm, Coll. R.D. Purchon, BM(NH).
West Thailand, 3 miles Southeast of Phuket in 80 feet on 20/2/1963, 1 spm., 28.5 mm, Coll. by R.T. Abbott, BM(NH).
Phuket, 30 m, 1 spm., 34 mm, BM(NH); 2 spm., 39.3 & 39.4 mm, FBC; 20 spm., 26.0 mm to 49.0 mm, AWC (Figs. 134, 135, 137 - 140); 7 spm., 28.7 – 50.0 mm, SPC.
Phuket, east Racha Is. and Mactan Is., pale shelled dwarf form, 2 spm., 24.3 mm & 24.4 mm, SPC.
Phuket, east Racha and Mactan Is., typical patterned dwarf form, 4 spm., 19.8 mm, 22.7 mm, 24.2 mm, 28.4 mm, SPC.
Phuket, east Racha and Mactan Is., dwarf with very clear spiral pattern, less rounded shoulders and pale yellow labial margin, 4 spm., 19.9 mm, 19.7 mm, 21.8 mm, 24.8 mm, SPC (Figs 143, 144).

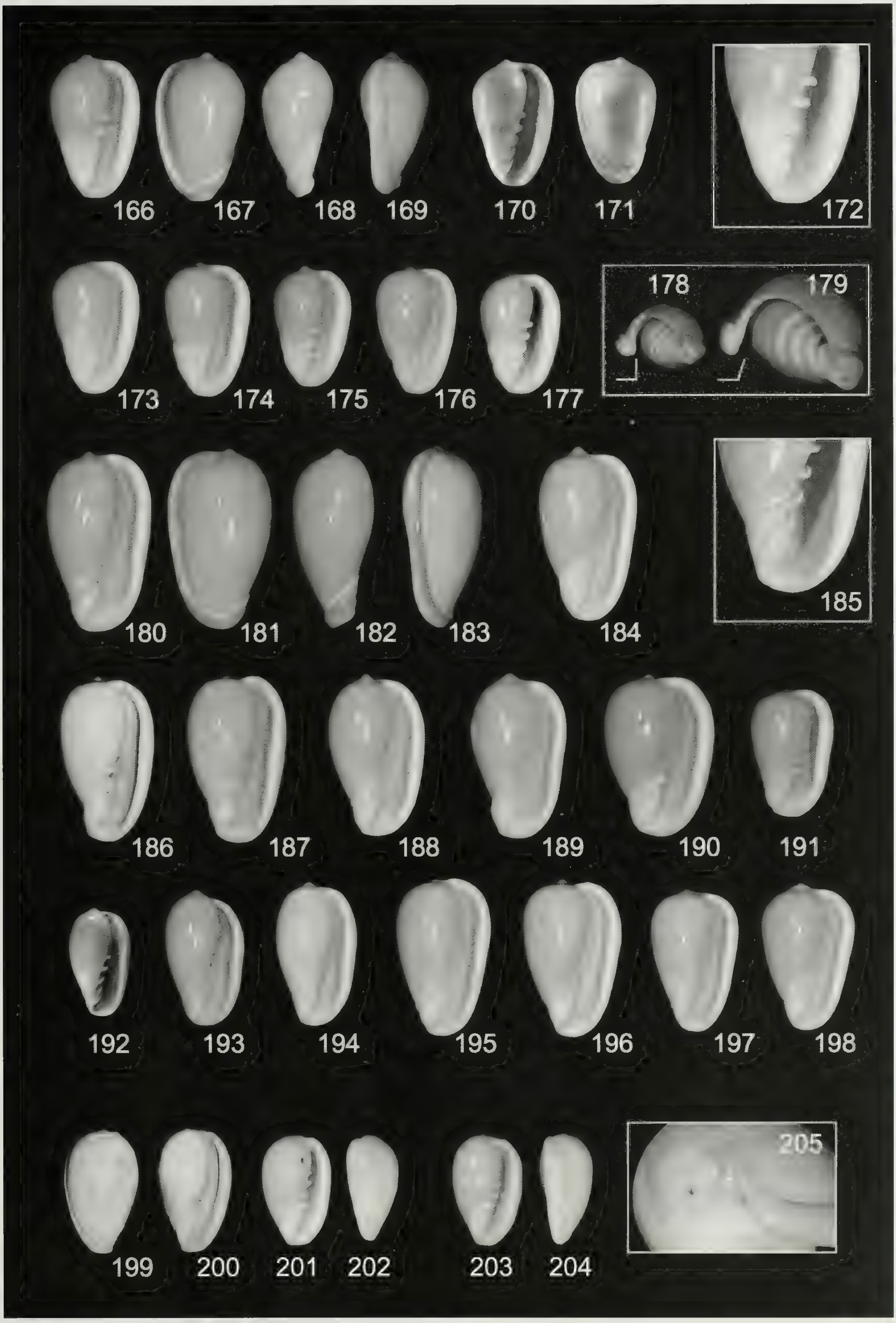
Figures. 166-205. *Cryptospira elegans* group ctd.

166-178. *Cryptospira glauca* Jousseaume, 1875; **166-169.** Rameswarem, S. India, 28.0 x 17.9 mm, AWC; **170, 171.** *C. glauca*, syntype, 24.0 x 15.5 mm, MNHN; 172. Closeup of basal callus; **173.** Rameswarem, 25.7 x 17.1 mm, AWC; **174.** Rameswarem, 25.5 x 16.8 mm, AWC; **175.** Rameswarem, 23.1 x 15.3 mm, AWC; 176. Rameswarem, 25.0 x 16.1 mm, AWC; **177.** Madras, 23.8 x 15.3 mm, AWC; **178.** Cut-away labial section of *C. glauca*.

179. *C. strigata* Dillwyn, 1817, cut-away labial section.

180-198. *Cryptospira marchii* Jousseaume, 1875; **180-183.** La N'gu, Satun Province, Thailand, 34.0 x 20.0 mm, AWC; **184.** La N'gu, Thailand, 33.2 x 18.8 mm, AWC; **185.** Close-up of columella base; **186.** *Marginella Burchardi* Reeve, 1864, syntype, 31.9 x 19.1 mm, BM(NH) Reg. no. 1989146; **187-191.** La N'gu, Satun Province, Thailand, 32.0 x 19.0 mm, 31.0 x 18.4 mm, 31.2 x 18.3 mm, 30.7 x 21.2 mm, 24.2 x 15.7 mm, AWC; **192.** *C. marchii* Jousseaume, 1875, holotype, 20.4 x 11.7 mm, MNHN; **193-198.** La N'gu, Satun Province, Thailand, 25.8 x 15.0 mm, 27.2 x 15.6 mm, 30.0 x 18.1 mm, 29.5 x 19.0 mm, 27.2 x 17.0 mm, 27.8 x 17.7 mm, AWC.

199-205. *Cryptospira grisea* Jousseaume, 1875;
199-200. *Marginella obtusa*, Sowerby, 1870, holotype, Gulf of Martaban, Burma, 24.0 x 14.9 mm, BM(NH) reg. No. 1874.12.11.93; **201-204.** 21.2 x 13.4 mm, 19.7 x 12.4 mm, AWC; **205.** Close-up of spire and posterior end of lip.


166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205

Type locality. Not given in original description.

Distribution. West coast and islands of the Malaysian peninsula, including Thailand and the Nicobar Islands.

Descriptive notes. Shell solid, thick, glossy, length 17.5 – 50.0 mm (W:L = 56 - 65 %), obovate to subtriangular. Colour pale grey with darker bluish-grey fine axial markings which line up successionally to form a spiral pattern of randomly thick and thin lines. Labial margin classically deep orange-brown, occasionally cream, rarely opaque white. Lip straight to slightly inflexed, finely nodulose, rarely developing into weak labial denticles, even then only 10-15 in number and present in the middle third of the lip (Fig. 141). Spire of 3.5 whorls not including protoconch, low to moderately elevated. Protoconch pinkish-brown. Suture obscured by dark callus on last adult whorl (Fig. 138). Aperture straight, twice as wide as lip, flaring slightly anteriorly. Posterior end of lip lacking bevel, thinning and inserting on spire at level of suture (Fig. 134).

Columella with five plications, always with a thiner parietal lira posterior to, but not remote from fifth plication (Fig. 135). Plications bifurcate as they terminate, square topped. Gaining strength from 1st to 3rd, then progressively weaker to 5th. Basal callus (Fig. 137) absent to moderately strong, in region of first three plications. First three plications oblique, 4th and 5th and parietal lira lying more horizontally.

Remarks. This species was first published in the literature as a rudimentary illustration in Lister (1688). Redfield (1870) noted that this species had subsequently been referred to by at least six different names. It was confused with *C. strigata* by Sowerby (1846, Pl. LXXVII, figs. 148, 149) yet there are clear differences between the two species.

It can be distinguished from *C. strigata* on shell morphology alone. The single diminutive parietal lira (Fig. 134) masquerading as a 6th columella plication, is a constant shell character in *C. elegans* - it is always absent in *C. strigata*. In addition, the lip of *C. elegans*, though not entirely smooth edged, generally lacks denticles, and the posterior denticulated labial bevel seen so often in *C. strigata* (Fig. 159) is always absent in *C. elegans* (Fig. 134).

The differences in pattern and colour are less stable but the general trend is for a blue-grey spiral pattern to predominate in *C. elegans*, and an undulating axial one to feature more in *C. strigata*. The reddish-brown labial margin in *C. elegans* has been regarded as diagnostic but the form from Racha Island, Phuket (Figs 143, 144) has a pale yellow lip.

Troschel (1867) provided a rudimentary drawing of the radula of this species. The radula is 0.06 mm wide, the basal edge of each rachidian plate is convex and the cutting edge bears 9 cusps which gradually increase in size towards the middle.

The animal of this species is recorded here for the first time (Fig. 136). It was photographed by Mr. Komson Hongpattharakeeree (Thailand), at Laemson National Park, Ranong Province, Thailand (Andaman Sea, near to the Southern Mergui Archipelago) in 2010. This dwarf form was found crawling on the sand at low tide. The animal of *C. elegans* appears to be more intensely crimson-coloured than the animal of *C. strigata* decribed by Adams & Reeve, but photography of living *C. strigata* will be necessary for an accurate comparison to be made.

Cryptospira strigata (Dillwyn, 1817)

Figs 129, 131, 147, 148, 150 - 159

Voluta glabella undulata Chemnitz, 1788, Conch. X, p. 166, pl.150, figs 1423-4.
Voluta glabella var *θ*, Gmelin, 1788, ed. Syst. Nat., p. 3445.
Voluta glabella var c, Schreibers, i, p. 115, 1793, and Encyl. Meth. Vers. Pl. 377, fig. 7, 1798.
?*Voluta porcellana* Perry, 1811, Conch., pl. 17, fig. 2.
Voluta strigata Dillwyn, 1817, descr. Cat., p. 530. and in Wood, 1828, Index Testac., pl. 20, fig. 67.
Marginella strigata Kiener, 1834, Coq. Viv. p. 14, pl. 8, fig. 37.
Marginella undulata Deshayes, 1844, ed. Lam. Anim. Sans Vert. X, p. 451.
Marginella elegans var. Sowerby 1846, Thes. Conch. i., p. 385, pl. 77, fig. 148.
Marginella Bernardii Largilliert, 1845
Marginella undulata in Roberts, 1851, Pop. Hist. Moll. Pl. 4, fig.4 (animal); Chenu, 1859, Manuel de Conch., i, p. 199, fig. 1055; Reeve, 1864, Conch. Icon. *Marginella*, pl. 2, figs 5, 6a, b.

Type material. Not found.

Other material. Thailand, Andaman Sea, 15 spm., 25.2 - 49.1 mm, trawled offshore at 60 - 120 m, SPC; 25 spm, 27.0 - 45.0 mm (Figs 153, 154), AWC.
Malaysia, Strait of Malacca, elongated form, 3 spm., 38.5 - 45.9 mm, SPC; 37.0 - 47.0 mm, (Fig. 152), AWC.
Phuket, Rawai Beach, dwarf population, 20.8 - 27.5 mm, SPC; 2 spm., 22.5 mm, 26.9 mm (Fig. 156), AWC.
South Thailand, Kontong, 6 spm., 33.8 - 44.4 mm, AWC.
West Thailand, Satun, trawled in 85 m, 2 spm., 36.0 & 35.7 mm, AWC; Phuket, 2 spm., 42.0 mm & 40.3 mm, FBC; 2 spm., 42.0 mm & 43.0 mm, AWC; Knala Kedah, 1 spm., 36.0 mm, labelled '*M. elegans*', R.D. Purchon coll., BM(NH).
Malacca Strait, in prawn boat net at 60 m, 1 spm., 40.0 mm, AWC.
East Sumatra, Singkep Is, net in 60 m, 3 spm., 16.2 mm to 26.4 mm, AWC.
South Borneo, South Banjarmasin, net in 60 m, 1 spm., 27.0 mm, AWC.

West Kalimantan, Alan Tiga Is., net in 60 m, 2 spm., 21.0 mm & 23.0 mm, AWC.
'Malaysia', 1 spm., 21.4 mm, FBC.
Burma, 6 spm., 20.5mm to 22.5 mm, ATC.
Mergui Archipelago, 1 spm., 21.8 mm, BM(NH).
Singapore, 1 spm., labelled *M. undulata*, ex. Mrs DeBurgh coll, 30.5 x 19.6 mm, BM(NH).
China, 3 spm., labelled *M. undulata*, 19.5 - 23.0 mm, BM(NH).
Penang, 4 spm., 26.0 - 41.0 mm, BM(NH).
East Indies, Moulmein, 3 spm., unmeasured, BM(NH).
East Africa (err.), 2 spm., unmeasured, Ex. Mrs J. Lombe-Taylor coll., BM(NH).
West Thailand, Phuket, 2 spm., 44.3 mm & 37.5 mm, FBC; 16 spm., 38.0 mm - 45.0 mm, AWC; 1 spm., 35.5 mm, ATC.
South Thailand, Kantong, 1 spm., 33.5 mm, FBC.

Type locality. Given in error in the original description as 'Coasts of Guinea', a West African locality.

Distribution. Andaman Sea (west Thailand, Nicobar and Andaman Is, northeast Sumatra), Straits of Malacca (west Malaysian and east Sumatran coasts), across the Karimata Strait to western Borneo and its offshore islands.

Descriptive notes. Shell small to large (L=12 - 50mm, W:L= 53-68%), glossy, moderately thin and light to thick and heavy, elongate-ovate to obovate, narrowish to inflated posteriorly, tapering smoothly to base of columella. Colour khaki, pale grey, pale cream, fading to white. Spiral pattern of lines of fine dashes and chevrons densely grouped together at irregular intervals on body whorl resulting in denser spiral lines and zones. Dashes and chevrons line up and joined up axially to create axial pattern of irregular lines (Fig. 154) or larger zig-zags. Spiral pattern unrelated to position of plications. Spire exposed and moderately elevated or flat, protoconch raised (Fig. 147). Shoulder smooth, rounded. Aperture posteriorly immediately starts to widen to twice as wide as the labial varix, the widening continuing anteriorly to reach three times as wide. Lip thickened externally as a single varix with a smooth rolled edge (cutaway of lip shown in fig. 179 alongside that of *C. glauca*). Internal aspect of the lip irregular to denticulate. Denticles strongest posteriorly, 10-15 grouped on a bevelled straight edge at the posterior end of the lip, then gradually diminishing in strength from posterior to anterior. Anterior notch absent, moderate posterior notch. Lip extends to level of or slightly beyond apex, curving round to insert into callus at suture level. Columella with five placations; first moderately strong, oblique. Second very close to the first, also oblique. Columella somewhat excavated between 2nd and 3rd plications. Thick anterior ventral callus, cream to orange, merging with the distal ends of the first three plications, and strongly present around anterior end to merge with lip (Figs 150, 151). Parietal surface posterior to plications is smooth.

Remarks. As well as colour pattern variability, this species is also tremendously variable in size, and to a lesser extent shape;

i. Pattern variation

The axial pattern varies from heavily marked shells with a distinct undulating effect [the *M. undulata* of Deshayes, (Figs 148, 154)] through ones where the pattern becomes progressively more faint and disorganised (Fig. 153), to creamy coloured unpatterned shells which are often called *C. strigata* var. 'unicolor', and in old collections, *M. Burchardi* Reeve. Intergrading series of fully patterned to unpatterned shells are seen.

ii. Size variation

The specimens dredged from down to 60 metres in the Andaman Sea by prawn fishermen are the largest, frequently reaching 50 mm in length.
Smaller specimens are found at the lower end of the Straits of Malacca (Sumatra and Peninsular Malaysia). The smallest specimens (Fig. 157), as little as 12 mm in length, are found at the extreme southern end of the range in the Karimata Strait and the islands of western Kalimantan and eastern Sumatra.

iii. Shape variation

The shape varies from inflated (W:L 68 %) to narrow and elongate (W:L 53 %). Specimens deep dredged in the Andaman Sea are generally very inflated and have wide apertures and lack extensive callus formation (Fig. 153). Narrow specimens with a khaki colouration matching the description and figure of *M. Bernardii* Largilliert very closely, can be found in West Kalimantan (see Dharma, 2005, p. 151, pl. 50, 15a, c.) Localised internal callus formation at the posterior end of the labrum is frequently seen and it forms a sharply angulated internal bevel, which is often deeply denticulate when compared with the rest of the lip (Fig. 159). This character can also be present on otherwise non-callused specimens of *C. strigata.* It is always absent in *C. elegans* (Fig 134), is very weak in *C. marchii* (Fig. 180), and takes on a different shape altogether in *C. praecallosa* (Fig. 160). The ab-apertural callus is variable and different extents are shown of it in figs 150 and 151. Compare this callus with that of *C. praecallosa* (Fig. 149) – in the latter the callus extends much further, onto the bodywhorl.
In the Strait of Malacca, a very elongate and pale form can be found (Fig. 152). It used to be possible to find a very short and squat form (Fig. 156) at low tide at Rawa Island, Phuket, but due to habitat destruction this form is now locally extinct (communication from Somwang and Somnuek Patamakanthin).

Cryptospira praecallosa (Higgins, 1876)
Figs 149, 160 - 165

Marginella praecallosa Higgins, 1876. Journ Conch., i, p. 136.
Marginella loebbeckeana Weinkauff, 1878 Syst. Conch. Cab., p.33, pl. v, f.9,12.
Marginella lobbekeana "kob", Paetel, 1888 (in error)

Type material. *Marginella praecallosa* Higgins, 1876, 1 ad spm, holotype, 25 x 12 mm (Fig. 163), MCM.
Marginella loebbeckeana Weinkauff, 1878, 1 ad sh, holotype, no locality, 29.8 x 19 mm (Figs. 161, 162), LMD. [Note: there is a 1.2 mm discrepancy between the actual length measurement of this shell (29.8 mm) and that recorded by Weinkauff (31 mm). The widths are the same. That this is still the type specimen is, in my opinion, beyond reasonable doubt; It is the only specimen of *C. loebbeckeana* present in LMD and has a label handwritten by Weinkauff. It matches the original but inaccurately drawn figure very well, and the colour is the same. As for the length measurement discrepancy, Weinkauff only provided shell measurements in whole millimetres throughout his monograph, which introduces a margin of inaccuracy of all of his measurements].

Other material. Ranong, Andaman Sea, Thailand, 4 ad. spm., 33.9 x 20.9 mm, 34.5 x 21.7 mm, 33.8 x 19.8 mm, 36.2 x 21.6 mm, and 1 subadult spm., 32.0 x 20.1 mm, (Figs 160, 164, 165), AWC.

Type locality. Unknown

Distribution. Andaman Sea coast of Thailand to Sumatra.

Descriptive notes. Shell medium sized (L = 25-36 mm, W:L = 48-62%), smooth, glossy, very thick, heavy, ob-ovate, inflated posteriorly, anterior end very rounded. Colour pale cream, pale grey to brownish grey, with very weak pattern of irregular and broken axial and spiral lines. Spire exposed, flat to moderately elevated, protoconch elevated. Shoulder smooth, rounded. Posteriorly, aperture narrower than the varix, widening anteriorly to as wide as the varix. Lip thickened externally as a single very thick varix with a smooth rolled edge. Internal aspect of entire lip thickened, forming a sloping ridge along its entire length. Ridge grooved with 30 or more irregular lirae which terminate at a crest deeper into the aperture as denticles, strongest from posterior end of lip to a position level with the second plication, then rapidly weakening. External varix groove present. Anterior notch absent, posterior notch deep. Lip extends to shoulder level or slightly beyond, curving round to insert into callus at shoulder level. Columella slightly concave in region of first three plications. Five strong flat crested plications occupying 2/3 of the apertural length; first two close, oblique, curving anteriorly. Plications 3 to 5 stronger, grooved along their crest so they appear double, becoming more perpendicular to the axis. Parietal surface posterior to fifth plication is smooth but heavily callused, the callus often linking up with the anterior ventral callus which forms a distinct pad at the terminal ends of the plications, resulting in a very wide columella base.

Remarks. It is the heavy callus and the morphology of the inner aspect of the lip which distinguishes this species from its closest relative, *C. strigata*. The recently collected examples in AWC from the Strait of Malacca are a deep greenish brown with very heavy callus and distinctive labial denticles and lirae (Figs 160, 164, 165) which certainly concur with the degree of circum-apertural thickening seen in the holotypes of both *M. praecallosa* Higgins, 1876 (Fig. 163) and *M. loebbeckeana* Weinkauff, 1878 (Figs 161, 162). Tomlin (1917) regarded these taxa to be junior synonyms of *C. strigata*, but the differences between *C. praecallosa* and *C. strigata* are clear;

1. the angulated and heavily denticulate inner labial bevel seen in *C. strigata* (Fig. 159) is replaced in *C. praecallosa* and *C. loebbeckeana* by a more gently sweeping, lirae-covered callus 'slope' which runs the entire length of the lip and ends as a denticulated ridge within the aperture (Figs 160, 161).
2. The plications in *C. strigata* are also a little more oblique than in *C. praecallosa*, and
3. the very thick anterior ventral callus in *C. praecallosa* which is only matched by that of *C. glauca*.

C. praecallosa and *C. loebbeckeana* should be regarded as conspecific, and *C. praecallosa* is the valid name of this species since its description predates that of *C. loebbeckeana*.

Cryptospira glauca Jousseaume, 1875
Figs 120, 166-178

Cryptospira glauca, Jousseaume, 1875, Rev. Mag. Zool., p. 234-235, pl. 8, f.1,
(non-*Marginella glauca* G. Fischer, 1807 = *Bullata bullata*, Born, 1778).

Type material. 1 lot of 1 sh., conserved dry, Syntype, 24 x 15.5 mm, locality unknown, (Figs 170, 171), MNHN.

Other material. Rameswarem, India, 6 spm., 25.0 x 16.1 mm, 25.9 x 16.8 mm, 25.8 x 17.1 mm, 28.0 x 17.8 mm, 23.1 x 15.3 mm, 22.5 x 14.9 mm, (Figs 166-169, 173-176), AWC; 2 spm., 21.35 mm & 22.0 mm, FBC.
Pondicherry, 22.0 mm, BM(NH).

Madras, Tamilnadu, India, 2 spm., 23.8 mm & 24.0 mm, trawled in 10 fathoms on muddy sand, FBC; 1 spm., 25.9 mm, trawled in 20 fathoms on muddy sand, FBC; 4 spm., 23.5 x 15.9 mm, 23.8 x 15.3 mm (Fig. 177), 23.1 x 15.5 mm, 24.1 x 15.4 mm, trawled, AWC.

Type locality. Originally unknown. Designated as Singapore (Coomans, 1969). Herein redesignated as Chennai (Madras), India.

Distribution. Bay of Bengal – northeast Sri Lanka and along the eastern coast of India.

Descriptive notes. Shell medium sized (L = 21 - 28 mm, W:L = 63.5 to 66 %). smooth, glossy, solid. Shape variable; ovate, obovate, subtriangular. Colour an even pale bluish to greenish - grey. Labial margin same as base colour at the deep marginal groove, fading to pale cream at the labial border. Inner labial surface finely denticulated with 30 or so irregular denticles, strongest in middle third. Aperture slightly wider than labial margin, more or less straight, not widening to any extent anteriorly.
Spire of 3.5 whorls not including protoconch, moderately elevated, brownish. Suture only distinct on last adult whorl, and white coloured. Posterior end of inner lip narrowing only slightly, and slightly bevelled on inner surface extending to apical level.
Columella with five plications, occupying 2/3 of aperture. First three oblique; first weak and close to stronger second. Opaque white basal callus in region of terminus of first three plications, extending strongly up the anterior ab-apertural shell surface. Posterior labial insertion callused to level of edge of the protoconch. Third plication strongest and longest. Fourth and fifth reducing in strength and becoming more horizontal.

Remarks. Tomlin (1917) noted incorrectly that *C. loebbeckeana* and *C. glauca* were one and the same, which may account for current specimens often being labelled *C. glauca loebbeckeana*. *C. loebbeckeana* has been shown herein to be a synonym of *C. praecallosa*, a close relative of *C. strigata*.
The main character with which *C. glauca* can be reliably separated from *C. marchii* is the anterior ab-apertural callus which is always present in *C. glauca* (Figs 120, 172) and always absent in *C. marchii* (Figs 121, 185). Secondary charcters are size differences (*C. glauca* does not exceed 28 mm whereas *C. marchii* regularly does), and labial morphology (the inner lip of *C. glauca* is always denticulate whilst that of *C. marchii* is usually smooth). The locality data, if to be relied upon, is also a giveaway as the ranges do not overlap; any Bay of Bengal / Indian locality will be *C. glauca*, whereas any Andaman Sea / Burmese / Thailand / Malaysian locality will always be *C. marchii*.

Cryptospira marchii Jousseaume, 1875
Figs 121, 180 - 198

?*Marginella Burchardi* Reeve, 1864, pl. 2, f. 3a,b. (non *M. burchardi* Dunker, 1852).
Marginella elegans var. Sowerby 1846, pl. 77, fig. 149.
Cryptospira marchii Jousseaume, 1875, 3(3), p. 235-236.

Type Material. *Marginella Burchardi* Reeve, 1864 (Label; Nicobar Is., annotated "*strigata* Dillwyn"), 3 spm., preserved dry, syntypes, 31.9 x 19.1 mm (Fig. 186), 31.9 x 18.7 mm, 31.7 x 19.0 mm, BM(NH) Reg. No. 1989146.
Cryptospira marchii Jousseaume, 1875. 1 lot of 1 spm., preserved dry, Malacca, Syntype, 20.4mm, (Fig. 192), MNHN.

Other material. Southern Thailand, Andaman Sea, Ranong Province, Bang-Kin to Nang-Yon, 4 spm., pale grey form, 25.3 mm – 31.3 mm, taken by prawn and sea cucumber trawlers in 5-15 metres on muddy sand, SPC; Satun Province, N'gu, 25 spm., 28.0 mm - 34.0 mm (Figs 180-185, 187-191, 193-198), AWC.

Type locality. Malacca

Distribution. Andaman Sea from the Mergui Archipelago (Burma), west Thailand, Straits of Malacca (Sumatra and peninsular Malaysia) to the islands of the Karimata Strait.

Habitat. 5-15 metres on muddy sand.

Descriptive notes. Shell medium sized (L= 20-40 mm, W:L ratio 56-65%), light, thin, glossy, plain bluish grey or cream, Shape variable; ovate, obovate, elongate ovate and subtriangular. Labial margin darker externally, fading to opaque white at its edges and internal surface. Inner labial surface smooth, rarely finely denticulated with approximately 30 denticles or undulations, and either straight, to slightly inflexed at its mid-point. Spire low to moderately elevated, of 3.5 whorls including the protoconch, suture visible as an opaque white line. Aperture wide (2-3 times as wide as lip thickness). Columella occupying 2/3 of apertural length, with five oblique plications; 1st very thin, 2nd and 3rd increasing in strength, 4th and 5th weakening again, and remaining relatively oblique. Parietal lira and callus always absent. Weak to moderate anterior ventral callus extending to between the third and fourth plications, its edge being well demarcated by a ridge extending from between these two plications, which passes round to join up with the edge of the varix adjacent to the varix groove.

Remarks. The syntypes of *M. Burchardi* are labelled as coming from Nicobar Is., a good locality for the species, but Reeve (1864) cites Ceylon and E. Africa

as the type locality. Specimens so labelled are not present in the collection at the BM(NH), (K. Way label, 1989, and subsequent searching by the first author). As *M. Burchardi* Reeve, was a preoccupied name, Jousseaumes name is the valid one for this species.
The raised ridge between the third and fourth plication, bordering the weak anterior ventral callus is strongly evident in this very variable species, and it is easily distinguishable from *C. glauca*, a species with which it is frequently confused, by its lack of both anterior ab-apertural callus and labial denticles.

Cryptospira grisea Jousseaume, 1875

Figs 199 - 205

Marginella obtusa Sowerby, 1870
Persicula grisea Jousseaume, 1875, 3(3):268 (*nomen novum* for *M. obtusa*, Sowerby, 1870, non-Sowerby, 1846).
Marginella sexplicata Weinkauff, 1879, p. 85, 86, Taf. 16, figs 6, 7.

Type material. Gulf of Martaban, 1 ad sh, 24.0 x 14.9 mm, holotype of *M. obtusa* Sowerby, 1870, BM(NH) Reg. No. 1874.12.11.93, ex. Mrs J. Lombe-Taylor coll., Indian Museum, (Figs 199, 205).

Other material. 2 spm., Locality unknown, 21.2 x 13.4mm, 19.7 x 12.4mm, AWC (Figs 201-205).

Type locality. Gulf of Martaban (Burma). The name 'Pegu' is written on the original label, although this is 80km inland.

Distribution. Unknown. Possibly restricted to Burmese waters.

Descriptive notes. Shell medium sized (L=19.7-24.0 mm, W:L ratio 60 – 62 %). Shell ovate, solid, thick, uniformly pale cream. Shoulder very rounded, shell tending towards pyriform, tapering to a more pointed anterior end. Spire very low, of 3.5 whorls, with raised crest at suture of last adult whorl only, forming a callus ring on the top of the spire. Labial margin thick, same colour as rest of shell. Thinning lip sharply angled in lateral view at posterior end creating a deep posterior notch (Fig. 205). Aperture evenly narrow, widening very little anteriorly. Inner labial margin with up to 30 small denticles which reach to edge of labial margin and along a ridge internally. Columella with five plications and always an obvious parietal lira mimicking a 6th plication. First plication thin and weak, second to third stronger, flat topped, fourth and fifth getting weaker. Parietal lira posterior to fifth plication but not remote from it. Only callus deposition parietally at posterior labial insertion, and no callus at the rather pointed base of the columella.

Remarks. Since Sowerby's name was preoccupied, Jousseaume was perfectly entitled to rename this species. Under either name it has always been poorly known because until now, as far as I am aware, the only known specimen has been the holotype of *M. obtusa*. The two examples of this species in the authors collection match the morphology of the holotype of *M. obtusa* perfectly, and confirm that *C. grisea* is indeed a valid species and that the holotype is not simply a malformed shell of another species. The distinctive shell characters include a uniformly narrow aperture, five very strong, flat topped plications and a smaller parietal lira mimicking a 6th plication. The raised, circular beading of callus present at the suture (Fig. 205) is very obvious and diagnostic. The morphology of the posterior end of the lip is unlike any other '*elegans*' group species in that its edge thins noticeably, and from a lateral view, the posterior end of the lip is sharply angled apically (Fig. 205) unlike the more sweeping profiles seen in other members of the genus, and this helps to create the characteristic deep posterior notch.

Cryptospira scripta (Hinds, 1844)

Figs 132, 206 - 217

Marginella scripta Hinds, 1844, Proc. Lond. Zool. Soc., p. 73; Hinds, 1844, Moll. Voyage Sulphur, p. 45, pl. 13, figs 16, 17.
Sowerby, 1846, Thes Conch., i, pl. 75, figs 83-85.
Chenu, 1859, Manuel de Conch., i, p. 197, fig. 1037.
Reeve, 1865, Conch. Icon., pl. 14, fig. 58.

Type material. Makassar Strait, 1 lot of 5 spm preserved dry, 6.6 mm, 6.6 mm, 6.5 mm (Figs 212, 213), 6.0 mm, & 5.6 mm, & 1 juv., 4.2mm, syntypes (cab. Belcher), BM(NH) Reg. No. 1844.6.7.44-48.

Other material examined. Malaysia, 1 spm, 5.75 mm, FBC.
Andaman Is, Port Blair, 12 spm, 8.6 - 10.6 mm, FBC.
Andaman Is, 70 spm (Figs 202-211), BM(NH) Reg. No. 1901.7.11.39
Malacca Strait, 6 spm, 5.0 - 8.7 mm (Figs 214-217), BM(NH).
Malacca Strait, numerous spm, 5.0 mm - 6.0 mm, MCM.

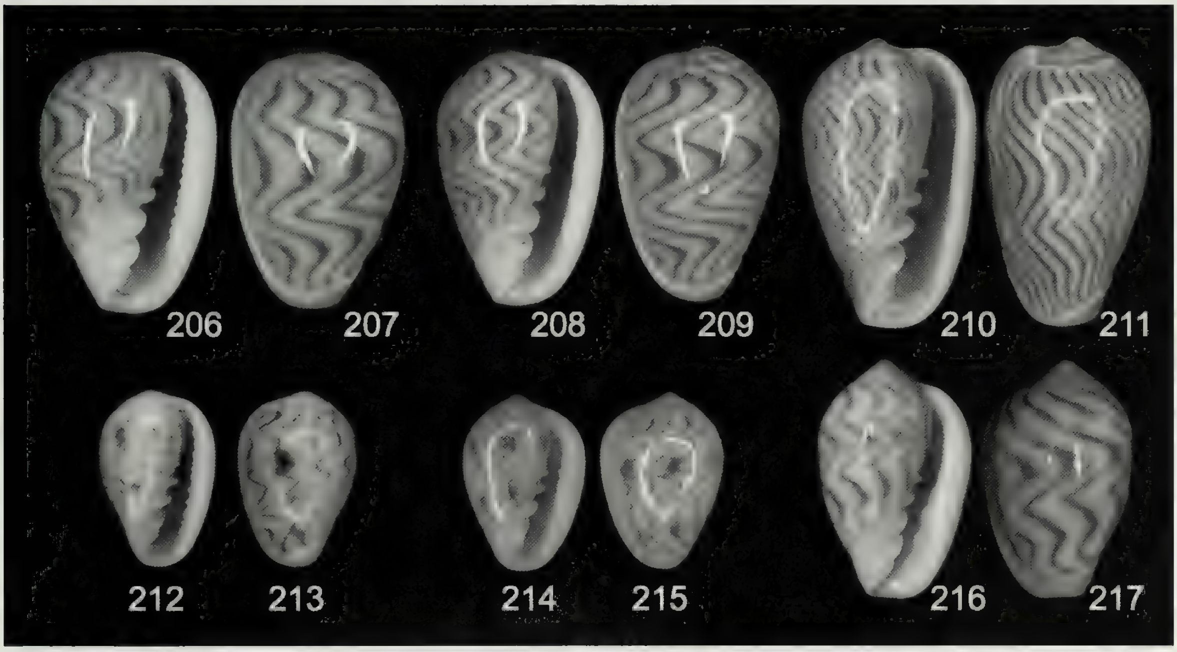
Type locality. 'Straits of Macassar' (Makassar Strait), Indonesia.

Distribution. An apparently fragmented distribution from the Makassar Strait, through the Strait of Malacca and on to the Andaman and Nicobar Islands.

Habitat. Originally recorded in the Makassar Strait as being found on coarse sand in 11-15 fathoms.

Descriptive notes. Shell small (L= 5-11 mm, W:L ratio 60 – 81 %), solid, smooth, glossy, stocky, ovate to obovate. Colour opaque white to cream, strong axial pattern of dark brown wavy lines. Rounded arrowheads pointing away from the aperture bearing thicker, darker markings in three zones, shoulder, midbody and anteriorly. The pattern can be regular or disorganised. Spire flat to elevated, 3 whorls, protoconch rounded, glazed over, suture indistinct. Labial margin thickened externally and internally, cream to white. Inner labial surface slightly rippled to strongly denticulate. Lip with 20-25 irregular denticles, strongest in middle third of lip, becoming progressively weaker posteriorly and anteriorly. Five columellar plications, occupying 2/3 of aperture; 1st weak and thin, 2nd strong, oblique and very close to 1st. 3rd strongest and much less obliquely positioned. 4th and 5th progressively weakening and lying more horizontal. Occasionally a small denticle posterior to the 5th plication is present. Aperture narrow, widening slightly anteriorly.

Remarks. Hinds' original description was published concurrently with that of *M. tricincta*, both being unfigured. Figures were published a month later in an account of the Zoology of the Voyage of HMS Sulphur 1836-1842. The type locality has to be regarded with caution as it is outside the normal range of distribution of '*Cryptospira elegans*' group species, and it is well known that locality records of Marginellids from both the Sulphur and the Samarang expeditions were often mixed up (Coovert, 1989a).
This is an unmistakeable little species, but when sufficient lots from different localities are examined, its variability becomes apparrent and it has to be conceded that several species may be concealed within the taxon. In Indonesian localities (Makassar and Malacca Straits) the shells are small (5.5 - 6.6 mm in length) and stocky. The shells from the Andaman Islands in the Indian Ocean are up to twice as large, more elongate, have a more rounded shoulder and generally a more depressed spire. The wavy axial lines can be thick and widely spaced or they can be fine and tightly grouped together. They may also be very regular or, somewhat haphazard in their orientation. In one particular specimen (Figs 210, 211) they are particularly fine and close together, and the shell morphology approaches that of small specimens of *C. strigata*, suggesting a close relationship to that species. Large numbers of specimens are present in most 19th Century European museum collections, but recently acquired specimens are decidedly rare. Occasional specimens are claimed as being sourced from Mauritius, but unless they have been transported there, this is unlikely as the marginellids of Mauritius are known to be more typical of an oceanic island fauna. Mauritius also lies on the Mascarene Ridge, outside the restricted distribution of the genus, which is confined to the Eurasian continental shelf.



Figures 206-217. ***Cryptospira elegans*** **group ctd.**

206-217. ***Cryptospira scripta*** (Hinds, 1844);
206, 207. Port Blair, Andaman Is, 9.75 x 6.55, AWC; **208, 209.** Port Blair, Andaman Is., 9.3 x 6.1 mm, AWC; **210, 211.** Andaman Is., 10.7 x 6.5 mm, BMNH; **212, 213.** Syntype, Makassar, 6.5 x 4.3 mm, BM(NH) Reg. no. 1844.6.7.44-48; **214, 215.** Strait of Malacca, 6.5 x 4.5 mm (MCM); **216, 217.** Strait of Malacca, 8.75 x 5.7 mm, BM(NH).

Cryptospira bridgettae n. sp.

Figs 145, 146, 218-222

Type material. Thailand, Ranong Province, Bang-Rin to Nang Yon, 5-15 m muddy sand, by prawn and sea cucumber trawlers.

1 ad spm., holotype, 20.05 x 12.58 mm, BM(NH) Reg. No. 20100327, (Figs 145, 146, 218-220).

1 ad spm., paratype, 17.57 x 11.08 mm, Reg. No. NMW.Z.2010.011.00001, (Figs 221, 222).

Type locality. Ranong Province, Thailand (Andaman Sea).

Distribution. Bang-Rin to Nang Yon, Ranong Province, Thailand

Description. Holotype small (L=20.0 mm, W:L = 63%), moderately thick, rounded subtriangular, tapering to rounded columella base. Colour of body whorl pale grey with occasional very fine opaque white axial growth marks, Clear spiral pattern of 21 darkr blue-grey regularly spaced narrow lines, some 2-3 times as wide as the narrowest but not organised at any particular position on the body whorl. On ventral surface pattern stops just posterior to third plication. Lip and base of columella and placations and protoconch opaque white. Spire moderately elevated, callus-free, of 3.5 whorls including protoconch. Shoulder smooth, rounded. Posteriorly, aperture as wide as lip, flaring only slightly anteriorly. Lip thickened externally as a single varix with a smooth rolled edge. Internal aspect of lip with 25-30 irregular denticles, strongest in posterior 2/3, weakening rapidly in anterior 1/3. External varix groove present. Anterior notch absent, posterior notch weak. Lip extending to and inserting at shoulder, just below apex. Columella with 5 plications occupying anterior 2/3 of aperture; first and second oblique, close together, moderately strong. Third strongest and less oblique, longer than the first two, slightly square edged. Fourth and fifth becoming more perpendicular to axis, and slightly square-edged. Fifth thinner, weaker and shorter than the fourth. Moderate basal callus. Parietal surface posterior to placations is smooth and parietal callus is very weak.

Remarks. This very distinctive, beautiful small species is closely related to *C. elegans* and can be easily distinguished from that species by virtue of its relatively small size, the pure opaque white and heavily denticulated lip, and the absence of a posterior parietal denticle. It is rare, known only from the two type specimens and is named in honour of Bridget Wakefield, wife of the author.

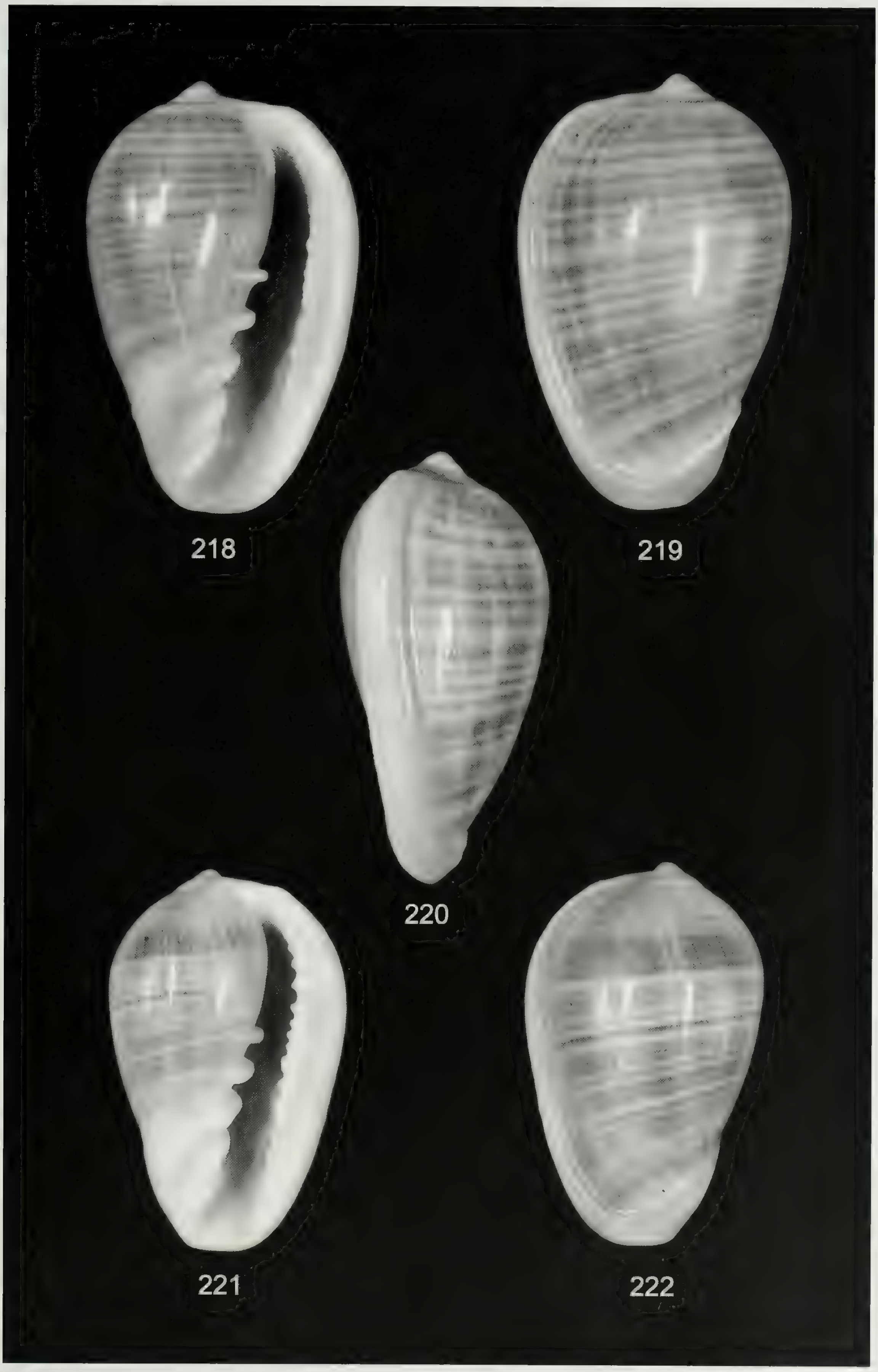
(D) THE INDONESIAN CRYPTOSPIRA FOSSIL RECORD

Beginning with the Pleistocene period (from approx. 2 million years to about 10,000 years ago) the global climate tended towards glacial. This was characterised by a generally drier climate than we experience now, with much of the worlds water being locked up in vast ice sheets extending from the poles and reaching as far as the tropics, including the Malaysian and Indonesian region. During these glaciations, Kalimantan, Sumatra, Java, Bali and Peninsular Malaysia were all connected into one large continental landmass, either icebound or as dry savannah punctuated by huge river systems, and Kalimantan was connected to the Philippines by a narrow strip of land, now Palawan. The fact that we are able to discover fossils of *Cryptospira* at inland sites in Java and Sumatra indicates that at other times during the Pleistocene (and even earlier in the Pliocene 2-5 MYA) these areas were submerged. Vertical tectonic plate movements partially explain this, but a more important contribution was made by climatic events. In fact, during the Pleistocene, sea levels rose and fell a total of 25 times between glacial and interglacial periods. Alluvial sediments from the giant river systems rapidly buried dead shells and created ideal conditions for their preservation in the fossilized state, with some specimens even retaining their colour patterns. As a result, the late tertiary / early quaternary fossil record of the genus in Indonesia is rich and remarkably complete. It is even possible to discover *Cryptospira* species that have long since gone extinct, telling us that the genus was probably even more diverse during this period than it is today.

Figures 218-222. *Cryptospira elegans* group ctd.

218-222. ***Cryptospira bridgettae*** n. sp.;

218-220. Holotype, 20.05 x 12.58 mm, BM(NH) Reg. no. 20100327; **221-222.** Paratype, 17.57 x 11.08 mm, Reg. no. NMW.Z.2010.011.00001.


218
219
220
221
222

The principal sites for fossil *Cryptospira* are at Sangiran in central Java, and Pasir Ipis and Cimanceurih in west Java, although fossil shells are also found on beaches facing the Indian Ocean at Suka Hujan, as a result of coastal erosion. It is relatively straightforward to associate species of living *Cryptospira* with their ancestral forms as revealed by their late Pliocene and Pleistocene fossils. A total of 12 fossil *Cryptospira* taxa have now been listed, including the two new species described herein. They can all be allocated to each of the three species groups defined earlier. As far as the recent taxon *C. tricincta* (of authors) is concerned, in it's fossil state we can assemble a complex of four non-intergrading morphologies, reinforcing the multiple species concept of that taxon promoted earlier, and demonstrating that the separation into the various morphospecies took place well before the Pliocene period, 3-5 MYA. The '*Cryptospira tricincta*' and '*Cryptospira ventricosa*' groups, having their centres of distribution in Indonesia, are unsurprisingly the ones most frequently encountered in the Tertiary strata of Java.

Fossils of the '*Cryptospira tricincta*' group

'*Cryptospira tricincta*' group fossils are commonly found in late Pliocene strata at Sangiran in central Java. When studied in quantity, series of four distinctly different and non-intergrading morphologies are observed. The first three of these are;

(i) The typical three-banded form.

(ii) A narrow, thick-shelled, more callused form with a narrow aperture and a broad columella base, with faint spiral banding evident in well preserved specimens. This form was given the name *C. quinqueplicata* var. *minor* Martin, 1931 but Oostinghe (1938-1939) later relegated it to the synonymy of *C. tricincta*, Hinds.

(iii) A large, ovate, thin shelled, inflated form with a wide aperture.

Material examined

C. tricincta, Form (i), 1 lot:
5 ad. sh. examined from Sambung Macan, Sangiran, central Java, late Pliocene. Largest 17.51 x 11.43 mm, smallest 15.75 x 10.64 mm, average W:L = 65 %, (Figs 233-236).

C. cf. C tricincta Form (ii), 2 lots:
16 ad. sh. studied from Sangiran, central Java, late Pliocene, Largest 20.06 x 11.25 mm, smallest 17.09 x 9.67 mm, average W:L = 54% (Figs 241-243).
8 ad. sh, Sambung Macan, central Java, late Pliocene, Largest 19.47 x 11.35 mm, smallest 16.55 x 10.31 mm, average W:L = 60% (Figs 244-248).

C. cf. C tricincta Form (iii) 2 lots:
10 ad. sh from Sangiran , central Java, late Pliocene, largest 30.61 x 17.93 mm, smallest 24.52 x 13.43 mm, average W:L = 57%, (Figs 251-253).
4 ad. sh. Sambung Macan, Sangiran, late Pliocene, largest 30.44 x 17.78 mm, smallest 26.72 x 16.45 mm, average W:L = 60% (Figs 249-250).

Comments. No intergrades between these morphologies have been found - they are always easily separable, and perhaps all three could be considered as different (morpho) species. While it is, of course, not possible to state with total confidence the ancestral relationship of living species to fossil forms, it seems reasonable from morphologic comparison to conclude that form (i) is analogous to typical *C. tricincta.* Form (ii) could be analogous to the dwarf, narrow *Cryptospira cf. C. tricincta*, like those dredged in the Makassar Strait (Figs 21, 22), or to *C. wallacei* (Figs 34-37) although the parietal denticle between the fifth and sixth plications in that species are not present in the fossil. The distinctive giant ovate Form (iii) is not uncommon as a fossil, but seems to be scarce in the present. I am only aware of a single recent example in BM(NH), (Fig. 17) and a juvenile specimen recorded from deep water in the Makassar Strait by the CORINDON expedition (MNHN). The ability of these non-intergrading fossil forms to reflect almost identical present day forms suggests that the evolutionary splitting from an ancestral 'tricincta' form(s) occurred at least as long as 3-5MYA, and very possibly longer, and lends weight to the multiple species complex argument for *C. tricincta.*
A fourth, very distinctive form has recently been discovered (Figs 223-232). It is small, ovate, has a thick shell with very strong plications and a strong, open, regular axial pattern. Due to its morphologic originality and its pattern, it is herein named *C. bundharmai* n. sp. It is considered to now be extinct.
C. cloveriana has not been seen as a fossil. This is not unexpected as it has a more north-easterly distribution.

Fossils of the *Cryptospira ventricosa* group

The fossils of the *Cryptospira ventricosa* group are represented by the following taxa;

†*C. ventricosa* G. Fischer von Waldheim, 1807 (typical form)
†*C. ventricosa* var. *minor* Martin, 1895 (dwarf form)
†*C. sangiranenesis* Martin, 1906 (a distinct and valid species, extinct since the Pleistocene)
†*C. trailii* Reeve, 1865 (listed as a form of *C sangiranensis* Martin, 1938) in Oostinghe, 1938
†*C. dactylus* var. *minor* Pannekoek, 1936
†*C. dactylus* var. *inflata* Martin, 1895

Material examined

C. ventricosa G. Fischer von Waldheim, 1807 (typical form), 1 lot;
7 ad. sh. from Pasir Ipis, west Java, Middle Pliocene, 7 ad. sh., largest 38.25 x 25.89 mm, smallest 26.17 x 18.44 mm, average W:L = 66 %, AWC (Figs 258, 259).

C. ventricosa var. *minor* Martin, 1895 (dwarf form), 1 lot;
3 ad. sh. from Pasir Ipis, west Java, middle Pliocene, 23.96 x 16.28 mm, 22.71 x 14.84 mm, 20.37 x 13.44 mm, AWC.

C. sangiranenesis Martin, 1906. 3 lots:
11 ad. sh. from Pasir Ipis, west Java, middle Pliocene, largest 19.05 x 10.33 mm, smallest 12.38 x 7.29 mm, average W:L = 56%, AWC (Figs 260, 261).
4 ad. sh. from Cimanceurih, west Java, Pliocene, largest 15.82 x 10.22 mm, smallest 11.1 x 7.07 mm, W:L = 64%, AWC.
7 beach worn ad. sh. from Suka Hujan, west Java, largest 16.91 x 10.80 mm, smallest 10.34 x 7.05 mm, AWC.

C. dactylus var. *minor* Pannekoek, 1936. 2 lots:
8 ad. sh. from Pasir Ipis, west Java, middle Pliocene, largest 30.14 x 14.74 mm, smallest 20.04 x 9.53 mm, average W:L = 48%, AWC.
3 ad. sh. from Sambung Macan, Sangiran, central Java, late Pliocene, 23.96 x 11.54 mm, 32.78 x 16.55 mm, 33.00 x 15.44 mm, average W:L = 49%, (Figs 254, 255), AWC.

C. dactylus var. *inflata* Martin, 1895. 3 lots:
1 ad. sh. from Pasir Ipis, west Java, middle Pliocene, 39.71 x 18.90 mm, AWC.
2 sh. from Sambung Macan, Sangiran, central Java, late Pliocene, 52.79 x 24.91 mm (Fig. 257), 44.54 x 20.61 mm (juv.), AWC.
5 ad. sh. from Sangiran, central Java, late Pliocene, largest 41.18 x 22.33 mm, (Fig. 256), smallest 33.65 x 17.65 mm, average W:L = 53%, AWC.

Comments. All the various shell morphologies of recent specimens of *C. ventricosa* are found at Pasir Ipis in the middle Pliocene fossil record of West Java (Figs 258, 259). An evolutionary tendency for an overall reduction in the thickness of parietal callus deposits and in the thickness of the shell itself has been reported (Dharma, 2005). Martin (1895), described a dwarf form, *C. v. minor*, from the younger Tertiary of Java, and it is also known from Sumatra and Kalimantan (Oostingh, 1935:96-98).
C. sangiranenesis Martin, 1906 is a commonly occurring fossil from this group, although this species appears to have gone extinct (Figs 260, 261). The highly angular shoulder and extended posterior labrum are its distinctive features, and in this respect it resembles *C. trailii* and narrow *C. ventricosa.* It is possible that it is a precursor to the recent *C. trailii* although the latter has made its own appearance as a fossil in the literature. It was figured by Oostinghe (1938-39, pl. 8, figs 154 a, b), but was recorded by him as a form of *M. (C.) ventricosa sangiranensis* Martin, 1906. Clearly the two species are very close, but *C. sangiranensis* attains a much larger size and is broader.
Although only represented in the recent as a single species, there are two fossil morphologies making up a *C. dactylus* complex, and these are found at two different sites in Java. The middle Pliocene deposits of Pasir Ipis and the late Pliocene of Sangiran contain a large form (35 to 52mm in length) which has a wide aperture, often a very strong parietal callus pad, and a much more tapering shell (Figs 256, 257). This form was given the varietal name '*inflata*' by Martin (1895), but is so different to recent *C. dactylus* that it was probably a distinct species in its own right. It has not been collected in the recent and is probably extinct. Both sites also contain a smaller form which has a relatively narrow aperture, proportionally thicker lip, more cylindrical shell, and no parietal callus (Figs 254, 255). It was figured by Pannekoek (1936) as *C. dactylus* var. *minor* and is morphologically indistinguishable from the extant *C. dactylus.*

Fossils of the *Cryptospira elegans* group

The *Cryptospira elegans* group has only the eastern fringe of its recent distribution in Indonesia and therefore is not as well represented in the fossil record. In fact, to date there are only three published examples from Java;

'*Marginella* (*Cryptospira*) *ex aff. elegans*' (Oostinghe, 1938).
'*Marginella* (*Cryptospira*) *aff. loebbeckeana*' (Oostinghe, 1938)
Marginella birmanica Vredenburg, 1923 (apparently extinct)

A new fossil species of the *'Cryptospira elegans'* group has been found in late Pliocene deposits at Kemukus, Sangiran, Central Java. It appears to be closely related to *C. strigata*, and is described and named herein as *C. kemukusi* n. sp.
Sub-fossil *C. elegans* and *C. marchii* are brought up by tin dredging vessels working off Chalong Bay, Phuket, Thailand (Somwang Patamakanthin, pers. comm.).

† *Cryptospira bundharmai* n. sp.

Figs 223 – 232, 268-277

Type material. Holotype, central Java, Sangiran, Sumber Lawang, late Pliocene, 1 ad. sh., 13.44 x 8.68 mm, (Figs 225, 226, 268, 269), MGB 0000548.

Paratype 1, central Java, Sangiran, Kemukus, late Pliocene, 1 ad. sh, 13.01 x 8.83 mm, (Figs 229, 230), MZB Fos. 0056.
Paratype 2, central Java, Sangiran, Sumber Lawang, late Pliocene, 1 ad. sh., 17.36 x 11.38 mm, (Figs 223, 224, 270, 271), BDC.
Paratype 3, central Java, Sangiran, Kemukus, late Pliocene,1 ad. sh., 13.75 x 8.80 mm, (Figs 227, 228, 272, 273), AWC.
Paratype 4, central Java, Sangiran, Kemukus, late Pliocene.1 ad. sh., 14.63 x 9.77 mm. AWC.
Paratype 5, central Java, Sangiran, Kemukus, late Pliocene,1 ad. sh., 13.98 x 9.33 mm, (Figs 231, 232, 276, 277). AWC.

Other material. Central Java, Sangiran, Kemukus, 5 ad. sh., 18.3 x 12.1 mm, 17.5 x 11.4 mm, 13.9 x 9.4 mm, 15.0 x 10.0 mm, 14.1 x 9.5 mm, collected May 2000.
Central Java, Sangiran, 4 ad. sh., 15.02 x 10.03 mm, 14.39 x 10.46 mm, 18.17 x 11.36 mm, 15.33 x 10.92 mm, and 3 fragments, collected October 2000, AWC.

Type locality. Sumber Lawang, Sangiran, central Java.

Distribution. Only known from Sumber Lawang and Kemukus, Sangiran, central Java.

Description. Holotype small (L = 13.44 mm, W:L = 65%), moderately thick, heavy, ovoid, inflated, tapering to base of columella. Colour pale tan, with axial pattern of brown, equally and widely spaced, straight to slightly undulating lines, numbering 13 on the body whorl, and which follow previous growing edge of shell. Lip and columella cream coloured. Spire involute, immersed in callus. Shoulder smooth, rounded. Aperture very curved, posteriorly as wide as labial varix, only widening slightly anteriorly, extending to level of posterior end of the shell. Lip thickened externally as a single varix with a smooth rolled edge, internal aspect smooth, lacking denticles. External varix groove present. Anterior notch absent, posterior notch weak. Lip inserts to top of spire. Columella with six strong square-cresteded and very emergent plications, occupying 2/3 of aperture. First two oblique, second to sixth increasingly perpendicular to long axis. Anterior ventral callus in region of first four plications merges with thick parietal callus which extends over all of the parietal surface to the labial insertion.

Remarks. The very oval shape, strong plications and above all the strong axial pattern will distinguish this species from most specimens of fossil *C. tricincta*. It is named after Bunjamin Dharma, renowned author and expert on Indonesian mollusca, and discoverer of this species.

Figures 223-261. Indonesian Pliocene and Pleistocene fossil *Cryptospira*.

223-232. †***C. bundharmai*** n. sp., Sumber Lawang, Sangiran, central Java, late Pliocene; **223-224.** Paratype 2, 17.3 x 11.3 mm, BDC; **225-226.** Holotype, 13.4 x 8.6 mm, reg. no. MGB 0000548; **227-228.** Paratype 3, 13.7 x 8.8 mm. AWC; **229-230.** Paratype 1, 13.0 x 8.8 mm, reg. no. MZB Fos. 0056; **231-232.** Paratype 5, 13.9 x 9.3 mm, AWC.

233-236. †***C. tricincta*** form (i), Sambung Macan, Sangiran, central Java, Late Pliocene;
233-234. 16.1 x 10.8 mm, AWC; **235-236.** 16.4 x 10.9 mm, AWC.

237-240. †***C. kemukusi*** n. sp., Kemukus, Sangiran, Central Java, Late Pliocene;
237-238. Paratype 2, 17.3 x 11.3 mm, BDC; **239-240.** Holotype, 13.6 x 8.0 mm, reg. no. MGB 0000549.

241-248. †***C. tricincta*** form (ii);
241-243. Sangiran, central Java, late Pliocene, 17.5 – 19.5 mm, AWC; **244-248.** Sambung Macan, Sangiran, central Java, late Pliocene, 19.6 – 17.0 mm, AWC.

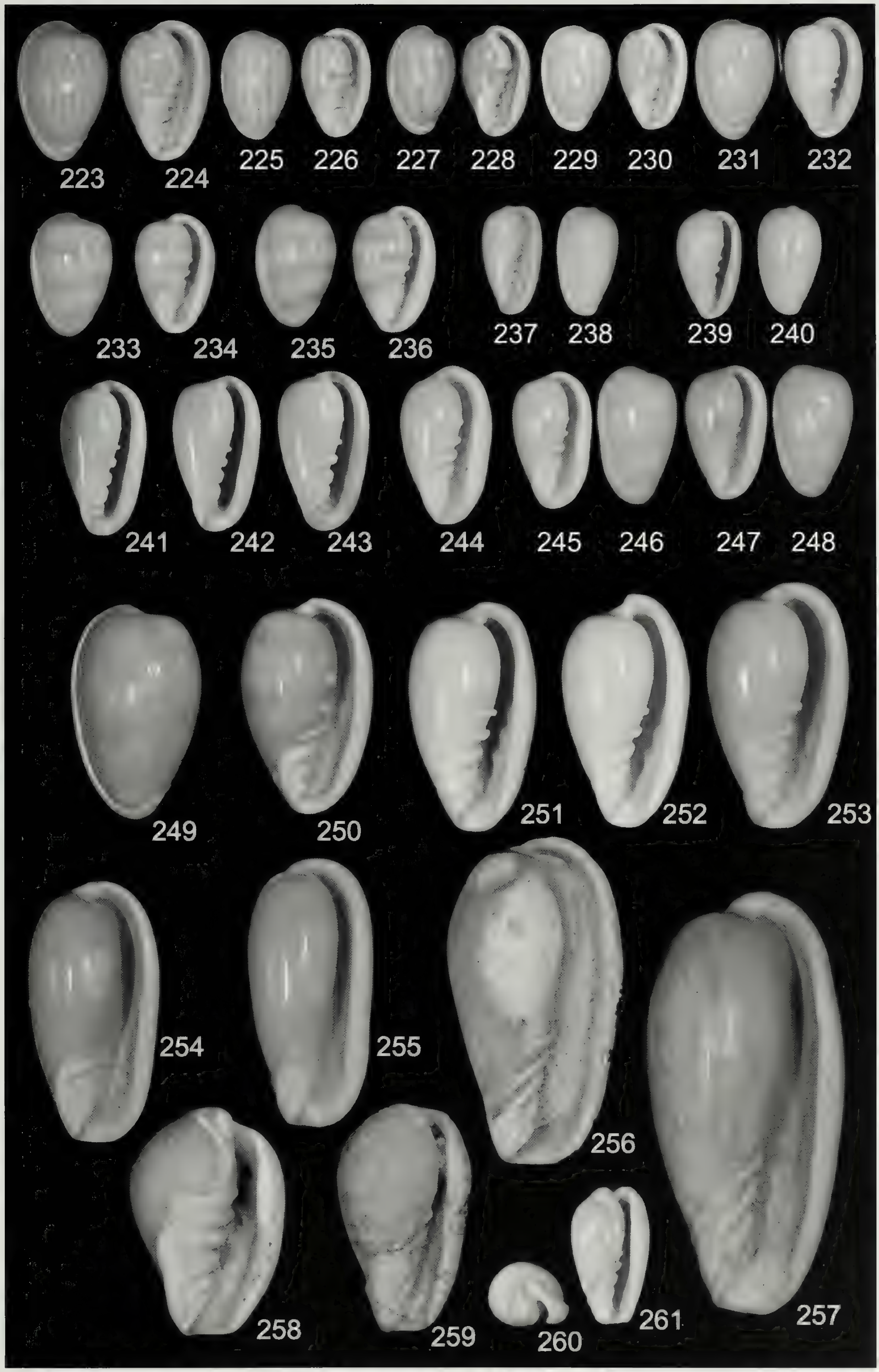
249-253. †***C. tricincta*** form (iii);
249-250. Sambung Macan, Sangiran, late Pliocene, 26.6 x 16.5 mm, AWC; **251-253.** Sangiran, central Java, late Pliocene, 30.0 x 18.2 mm, 30.5 x 17.9 mm, 30.61 x 18.0 mm, AWC.

254-255. †***C. dactylus* var. *minor*** Pannekoek, 1936 (=*C. dactylus* Lamarck, 1822);
Sambung Macan, Sangiran, central Java, late Pliocene, 32.7 x 16.5 mm, 33.0 x 15.4 mm, AWC.

256-257. †***C. dactylus* var. *inflata*** Martin, 1895;
256. Sangiran, central Java, late Pliocene, 41.1 x 22.3 mm, AWC; **257.** Sambung Macan, Sangiran, central Java, late Pliocene, 52.7 x 24.9 mm, AWC.

258-259. †***C. ventricosa*** Fischer von Waldheim, 1807. Pasir Ipis, west Java, mid-Pleistocene;
258. 36.8 x 23.5 mm, AWC; **259.** 28.6 x 16.6 mm, AWC.

260-261. †***C. sangiranensis*** Martin, 1906. Pasir Ipis, west Java, mid-Pliocene, 17.0 x 9.8 mm, AWC.


223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261

† *Cryptospira kemukusi* n. sp.

Figs 237 – 240, 262-267

Type material. Central Java, Sangiran, Kemukus, 6 ad. sh., late Pliocene, Collected April 2009;
Holotype, 13.62 x 8.01 mm, (Figs 239, 240, 264, 265), MGB 0000549.
Paratype 1, 11.65 x 6.85 mm,(Figs 266, 267), MZB Fos. 0057.
Paratype 2, 13.37 x 7.52 mm, (Figs 237, 238, 262, 263), BDC
Paratype 3, 12.55 x 6.99 mm, BDC
Paratype 4, 12.12 x 7.12 mm, AWC
Paratype 5, 13.5 x 7.67 mm, BDC

Type locality. Kemukus, Sangiran, Central Java.

Distribution. Only known from the type locality.

Description. Holotype small (L = 13.6 mm, W:L = 59%), rather thin, light, narrow-ovate, tapering smoothly to base of columella. Colour pale cream, overlaid with 22 regular fine axial lines of darker colour on the body whorl. Spire exposed, slightly elevated, of 3.5 whorls including slightly raised protoconch. Aperture rather straight, of even width along its length, as wide as the labial varix. Lip thickened externally as a single varix with a smooth rolled edge, denticles absent. External varix groove present. Anterior notch absent, posterior notch weak. Lip extends to shoulder level, inserting at suture. Columella with six oblique plications; first two very close, all plications very thin, sixth diminutive. Parietal surface posterior to plications is smooth. Anterior ventral callus absent, anterior end rounded.

Remarks. The exposed spire, narrow elongated shape, oblique plications and fine axial pattern clearly places this species in the *Cryptospira elegans* group, and is most likely closely related to *C. strigata*, but differs from it in that it has an extra plication and a narrower aperture. It is named after the type locality, and is probably an extinct species.

DISCUSSION

Phyletic Analysis

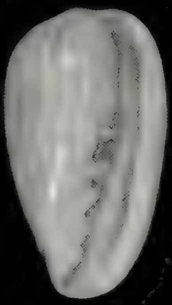
The radula morphologies of two *Cryptospira* species have been published. Coovert & Coovert (1990) extracted and examined the radulae of four specimens of *C. fischeri*, and Troeschel (1867) published a drawing of the radula of *C. elegans*. The rachidian plates of the radula of *Cryptospira* are wide, flat and 'comb-like' (Fig. 4) and resemble closely those of *Volvarina* and *Prunum*. It is necessary to compare the relatively low numbers of cusps present (21-28 cusps per plate in *C. fischeri* and 9 cusps per plate in *C. elegans*) with the cusp counts of the radulae of the Marginellid subfamily Marginelloninae, which is suggested by Harasewych and Kantor (1991) to be the most primitive group in the Marginellidae: *Marginellona gigas* (Martens, 1904) has from 58-59 to 83-85 cusps, and *Afrivoluta pringlei* (Tomlin, 1947) has 70-80 (Coovert & Coovert (1995). From this, Boyer (2001) deduced a high number of radular cusps to be a plesiomorphic character in this type of uniserial modified rachiglossan radula. Though statistically a very small sample size, the *Cryptospira* radulae examined have a considerably smaller number of cusps than those of the Marginelloninae, and a tendency to a smaller number than that seen in the *Prunum / Volvarina* complex. Further radular analyses across the range of *Cryptospira* species will be necessary before any concrete phylogenetic conclusions can be drawn, but if shown to be a consistent character, the relatively small cusp count could provide evidence to support the view that the genus split off relatively recently from the main *Prunum / Volvarina* lineage, and much later than other genera such as *Serrata* and *Dentimargo* which evolved during the Eocene.

More observations about the evolutionary development of *Cryptospira* in southeast Asia can be made by looking for clues in the fossil record and by making appropriate comparisons with recent forms. The fossil record of the genus is restricted to the Indonesian archipelago (Sunda Shelf Zone) and is completely absent from other major marginellid fossil assemblages worldwide. No fossils have been discovered which could be regarded as intermediate in form between *Prunum / Volvarina* and *Cryptospira* morphologies, and fossil species are very close morphologically to recent ones. From this we can infer that the genus evolved exclusively, rapidly and recently in the Sunda Shelf zone, approximately 3-5 million years ago.

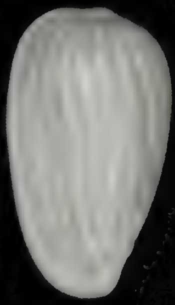
Figures 262-277. New *Cryptospira tricincta* group late Pliocene fossil species;

262-267. †***C. kemukusi*** n. sp., Kemukus, Sangiran, central Java, Late Pliocene; **262-263.** Paratype 2, 17.3 x 11.3 mm, BDC; **264-265.** Holotype, 13.6 x 8.0 mm, reg. no. MGB 0000549; **266-267.** Paratype 1, 11.6 x 6.8 mm, reg. no. MZB Fos. 0057.

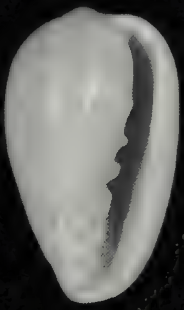
268-277. †***C. bundharmai*** n. sp., Sumber Lawang, Sangiran, central Java, late Pliocene;
268-269. Holotype, 13.4 x 8.6 mm, reg. no. MGB 0000548; **270-271.** Paratype 2, 17.3 x 11.3 mm, BDC;
272-273. Paratype 3, 13.7 x 8.8 mm, AWC; **274-275.** Paratype 1, 13.0 x 8.8 mm, reg. no. MZB Fos. 0056;
276-277. Paratype 5, 13.9 x 9.3 mm, AWC.



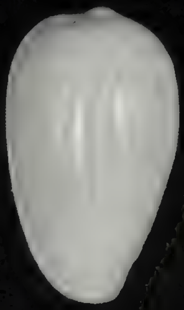
262



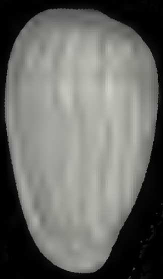
263



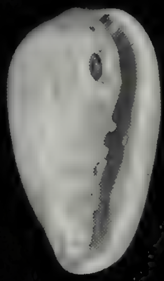
264



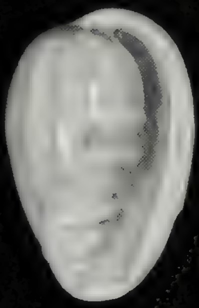
265



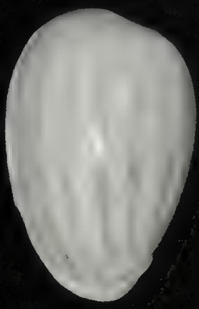
266



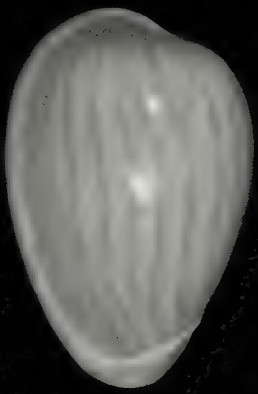
267



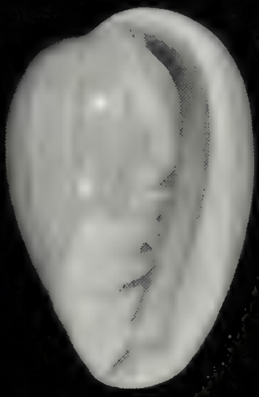
268



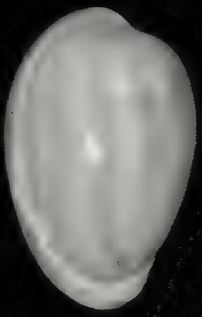
269



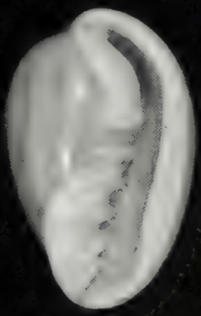
270



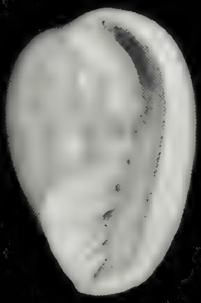
271



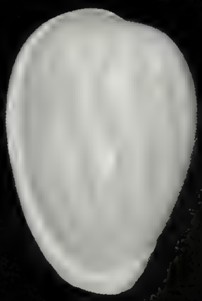
272



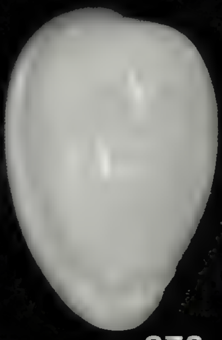
273



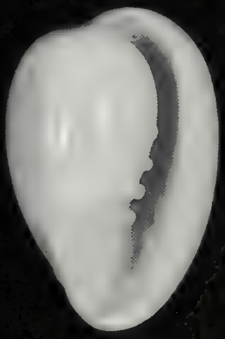
274



275



276



277

The shell characters of the genus are heterogenous with the range of morphologies and shell characters encountered in the *Prunum / Volvarina* complex, and the basic radula pattern and external animal anatomy also indicate a close ancestral relationship. *Cryptospira* therefore can be regarded as an offshoot of the main *Prunum / Volvarina* lineage. Although distribution of the genus now extends further than this, the Sunda Shelf remains the zone of maximum species diversity (both recent and fossil) and the place where there is overlap of all three of its species groups. The initial radiation away from the main *Prunum* lineage is therefore likely to have begun here. The three distinct species groups subsequently launched adaptive radiations from this central zone, becoming the dominant marginellid genus of medium to large shelled species in the vast Indo-west Pacific geographical area, and probably forcing other marginellid genera into retreat. Representing other genera there are currently only two species of large sized marginellid in this geographic region; *Volvarina obscura* (Reeve, 1865) and the deep water relict species *Marginellona gigas* (Martens, 1904). Such disharmonious representation of the family would imply that the ancestral *Cryptospira* explosively radiated into the Sunda Shelf zone, rapidly evolving into new species to take advantage of available niches to the exclusion of others. The great speciation potential of the genus may have also been driven by the hydroclimatic disturbances occurring throughout the Pleistocene period. The pressure thus exerted upon older *Prunum / Volvarina / Dentimargo* stocks may account for the disappearance in the recent of other medium - sized Indonesian fossil species such as *Marginella berberkiriana* (Martin, 1906) from the middle – Miocene, and may be a manifestation of the displacement of species from other genera by *Cryptospira* later coming to dominate their habitat. That dominance, so evident during the Pleistocene from the diversity of the fossil record may be on the wane in the recent. The fact that at least five fossil species have gone extinct since the Pleistocene, and the discovery of new fossil species and forms in the *Cryptospira tricincta* group that do not appear in the recent fauna could be telling us that the diversity of the genus was probably greater then than it is now. At least four fossil species have gone extinct (*C. sangiranenis, C. dactylus* var. *inflata, C. bundharmai* and *C. kemukusi*) and this could indicate that several *Cryptospira* lineages present in the Pleistocene are currently on the decline. For example, only one of the two *C. dactylus* forms present in the Pleistocene is extant, and the one remaining, *C. dactylus* of Lamarck, is uncommonly encountered. Another example is the extinction of one of the most common Pleistocene *Cryptospira* species, *C. sangiranensis*, leaving only the related and exceedingly rare species *C. trailii* as its closest relative. Falling diversity since the Pleistocene evident from these extinctions, coupled with the scarcity of some recent species which are common as fossils, may indicate that the genus has passed its adaptive potential and is currently in a state of gradual decline.

Biogeographic observations

Moving on from interpretations of the fossil record, it is necessary to examine the current biogeographic distribution of the genus, and to analyze the diversity of the species groups and sub-groups within it. Once the three *Cryptospira* groups were established and defined, individual species were allocated to their various groups and the resulting distributions were examined to check for continuity. In accordance with the 'Sarawak Law' of the English Biogeographer, Alfred Russel Wallace (1855), the species within each of the three groups were indeed found in patterns of continuous distribution, with the '*Cryptospira elegans*' group forming the most distinctive radiation and providing the supporting biogeographic evidence required for the exclusion of *M. mabellae* and *M. angustata* from the genus. Very closely related species, for example those forming sub-groups, were also found to occupy adjacent areas, as expected. The distribution maps of each group (Figs 5 - 8), show that there is a degree of central overlap in the region of the Java Sea. It appears that the three groups radiated outwards from here; the *Cryptospira elegans* group to the northwest along the Asian continental shelf towards India, the *Cryptospira tricincta* group to the northeast into Kalimantan, Palawan and the central Philippines, and the *Cryptospira ventricosa* group remaining, in the main, in the Java Sea but also extending north where it occurs sporadically in the South China Sea.

It is likely that the sea floor substrate of muddy sand provided a homogenous environment that allowed *Cryptospira* to easily disperse. The continuity of these shallow water substrates which lie on the continental shelf in the northeast Indian Ocean, from northern Thailand around the Bay of Bengal westwards to the eastern side of India and Sri Lanka, albeit punctuated by large river delta's, have allowed species of the *Cryptospira elegans* group to spread westward to these areas. In the same way, the continuity of habitat along the Asian mainland around the northern rim of the South China Sea has allowed several species from the *Cryptospira tricincta* group and the *Cryptospira ventricosa* group to disperse, with one species (*C. cloveriana*) reaching as far north as Taiwan. Elsewhere it is a different story. To the south and west of the Sunda Shelf the Indian Ocean coasts of Sumatra and Java are predominated by coral reefs and deep water, neither of which is favoured by *Cryptospira*. To the east of the central range lies the deep water of the Makassar Strait. Examples of *Cryptospira* from the ever insular Sulawesi, forming the eastern side of the Makassar Strait, do not appear to be available, although this would be important to check in any field study there. The Makassar Strait, coincides with the mid-section of the Wallace line, the imaginary biogeographic boundary separating the Eurasian and Australinean faunas, and here the deep water does appear to present a formidable barrier to the eastern dispersal of *Cryptospira*, just as it does for mammals, birds, insects and freshwater fish. The Philippine island of Palawan is different in that in geological terms it is an offshore island of the Asian mainland, separated from Kalimantan by the Balabac Strait, a shallow channel 145m deep. Palawan is indeed a hotspot of *Cryptospira* diversity with at least 5 *Cryptospira tricincta* group species represented.

The southern section of the Wallace line passes between the islands of Lombok (Lesser Sunda's or Nusa Tenggara) and Bali (Indonesia), but this has had limited influence upon eastern dispersal of two species of *Cryptospira*; *C. ventricosa* occurs in Lombok (Dharma & Dunlap, 1994), and a population of *C. dactylus* has also recently been discovered there (B. Dharma, pers. comm.). *Cryptospira* has not been recorded further into Nusa Tenggara than Lombok and is not found in the Banda, Arafura or Timor Seas. Apart from this small incursion, the south- eastern edge of the range of distribution of *Cryptospira* in the shallow seas of Indonesia is demarcated by the Wallace line, and coincides with the edge of the Asian continental shelf, beyond which the marginellid fauna reverts to relatively small oceanic species from numerous other genera.

ACKNOWLEDGEMENTS

This project would not have been possible without the considerable support of Bunjamin Dharma (Indonesia), who provided me with much needed information and study material. Many other friends and colleagues also made a significant contribution; Franck Boyer (France), Phil Clover (USA), Gary Coovert (USA), Marcus Coltro (Brazil), Komson Hongpattharakeeree (Thailand), Roland Houart (Belgium), Felix Lorenz (Germany), Tony McCleery (UK), Alistair Moncur (UK), Somwang and Somnuek Patamakanthin (Thailand), and Andrew Tournier (France). To them all I extend my grateful thanks.

Thanks are also due for assistance given by professional Malacologists. Kathie Way and Amelia MacLellan (BMNH), Harriet Wood and Jennifer Gallichan (NMW), Virginie Héros & Philippe Bouchet (MNHN), Elina Sufiati (MGB), Ristiyanti Marwoto (MZB), Tiziano Cossignani (MMM), Dr. R. Preece (CMZ), Nora MacMillan (MCM) and Alexander Sysoev (ZMUM) allowed access to museum type material and literature. In particular, I am deeply indebted to Dr. Silke Stohl and Mr. Boscheinen of the Loebbecke Museum, Dusseldorf, Germany, for providing vital photographs of the holotype of *M. loebbeckeana*, to my two referee's who encouraged me to stick to the facts, and to Roland Houart for his editorial support and infinite patience.

REFERENCES

Adams, A. & Reeve, L. 1850. In 1848-1850. Mollusca, in A. Adams, *The Zoology of the Voyage of HMS Samarang; under the command of Captain Sir Edward Belcher during the years* 1843-1846. London.

Bavay, A. 1902. Description d'une espèce nouvelle du genre Marginella. *Journal de Conchyliologie* 50(4): 407-408.

Bernardi, A.C. 1852. Description d'une Marginelle nouvelle. *Journal de Conchyliologie* 3(1): 59-60, Pl. 2, figs 6, 7.

Boyer, F. 2001. Espèces nouvelles de Marginellidae du niveau bathyal de la Nouvelle-Caledonie. *Novapex* 2 (4): 157-169.

Clover, P. W. 1968. *Marginella ventricosa* G. Fischer, 1807. *Hawaiian Shell News* 16(5): 6

Clover, P. W. 1979. Philippine *Marginella*. *Of Sea and Shore*. 10(1): 59-60.

Clover, P. W. 1981. The Marginellas of Southeast Asia. *Conchologists of America Bulletin*, 24: 6-7.

Coan, E. V. 1965. A proposed reclassification of the family Marginellidae. *The Veliger* 7(3): 184-194.

Coovert, G. 1987. A literature review and summary of marginellid external anatomy. *Marginella Marginalia* 3: 2/3, 10.

Coovert, G.1989(a). The *Marginella musica – diadochus* Group. *Marginella Marginalia* 6 (3-5): 17.

Coovert, G., 1989(b). A literature review and summary of published Marginellid radulae. *Marginella Marginalia* 7 (1-6), 1-37.

Coovert, G. 1990. A study of Marginellid Radulae Part 1: Type 6 Radula, '*Prunum / Volvarina* type. *Marginella Marginalia* 8 (1-6) Jan-June 1990, & 9 (1-6) July-Dec 1990, pp. 1-68.

Coovert, G. A. & Coovert, H. K. 1995. Revision of the Supraspecific Classification of Marginelliform Gastropods. *The Nautilus* 109(2-3): 43-110.

Coomans, H.E. 1969. On the identity of *Cryptospira glauca* and the related *Cryptospira ventricosa* (Gastropoda: Marginellidae). *Basteria*, 33(5-6): 85-92.

Cossignani, T. 2006a. Marginellidae and Cystiscidae of the world. Atlas with over 2,600 photos. L'Informatore Piceno, Ancona, Italy: pp. 1 - 408.

Cossignani, T. 2006b. Due nuove Cryptospira dall'Indo-Pacifico (Gastropoda: Prosobranchia, Marginellidae). *Malacologia Mostra Mondiale* 51: 5,6.

Dance, S.P. 1986. *A History of Shell Collecting*. Pp. I-xv, 1-265, 32 pls. 17 text figs. E.J. Brill, Leiden.

Dharma, B. 2005. *Recent & Fossil Indonesian Shells*. Pp. 1-424, Publ. Conchbooks, Hackenheim, Germany and by the author, Jackarta, Indonesia. ISBN 3.92 5919-70-8

Dharma, B. & Dunlap, E. 1994. The variability of *Marginella ventricosa* in the Java Sea. *Hawaiian Shell News*. XLII(9): 7.

Dillwyn, L.W. 1817. *A descriptive catalogue of Recent shells arranged according to the Linnean method; with particular attention to the synonymy*. 1: 1-580. London, John & Arthur Arch.

Fischer (Von-Waldheim), G. 1807. *Museum Demidoff 3. Végétaux et Animaux*: I-IX, 1-330, Moscow.

Gaskoin, J. S. 1849. Descriptions of seven new species of *Marginella* and two of *Cypraea*. *Proceedings of the Zoological Society of London* 19: 17-23.

Gray, J. E. 1847. A list of the genera of Recent Mollusca, their synonyms and types. *Proceedings of the Zoological Society of London, 1847.* Pt 15, (17): 129-219 [Marginellidae: pp.142].

Harasewych M. G. & Kantor Y. 1991. Rediscovery of *Marginellona gigas* (Martens, 1904), with notes on the anatomy and systematic position of the subfamily Marginelloninae (Gastropoda: Marginellidae). *Nemouria* 37: 1 - 19.

Higgins, H. H., 1876, in Marrat F.P. 1876. Descriptions of five new marginellae. *Quarterly Journal of Conchology*, 1: 136.

Hinds, R.B. 1844a. Descriptions of Marginella collected during the voyage of HMS Sulphur, and from the collection of Mr. Cuming. *Proceedings of the Zoological Society of London*, Part 12 = Vol. 14: 72-77.

Hinds, R. B. 1844b, Oct. The zoology of the voyage of H.M.S. Sulphur, under the command of Captain Sir Edward Belcher…during1836-1842, 2 (2): 25-48, pls.8-14. London [Marginellidae: pp. 44-46, pl. 13].

Ivanov, D.L., Kantor, Y.I., Sysoev, A.V., & Egorov, R.V. 1991. Type Specimens of molluscs described by G. Fischer von Waldheim in 1807, *Apex* 8(3): 71-94.

Jousseaume, F. 1875. Coquilles de la famille des Marginelles. Monographie. *Revue et magasin de Zoologie Pure et Appliquée* 3(3): 164-271, 429-435, pls. 7-8.

Kaicher, S.D. 1973. *Card catalogue of world-wide shells*. Publ. by the author. Pack. No. 1, Marginellidae.

Lamarck, J.B.P.A. De M. De. 1822. *Histoire naturelle des animaux sans vertèbres*, 1st ed. Vol.7 “Mollusques” pp. 1-711, Paris, Giraudet. (Marginellidae pp. 355-365).

Largilliert, 1845. *Marginella*. Lamarck. M. Bernardii. Largilliert. *Magasin de Zoologie, D'Anatomie Comparée et de Palaentologie*, Recueil, 1845, ser. II, 7th yr., pl. 116.

Marrat, F. P. 1881. *Marginella (Cryptospira) ovalis*. Marrat, Swatow, China. 1 p. 1 col. Pl. (J. Chard delt.). Dated Jan. 18th, 1881.

Martin, K. 1891-1906. *Die Fossilien Von Java*. E.J. Brill, Leiden.

Martin, K. 1895. Die Fossilien von Java. *Sammlungen des Geologischen Reichsmuseums* 1(2-5): 1-132, E. J. Brill, Leiden.

Martin, K.1906. Die Fossilien von Java. *Sammlungen des Geologischen Reichsmuseums* 42; 301, Pl. XLIII, figs. 716, 716a. E. J. Brill, Leiden.

Melvill, J.C., & Standen, R. 1901. The Mollusca of the Persian Gulf, Gulf of Oman, and Arabian Sea, as evidenced mainly through the collections of Mr F.W. Townsend, 1893-1900; with descriptions of new species. Part 1: Cephalopoda, Gastropoda, Scaphopoda. *Proceedings of the Zoological Society of London, 1901*, 2(1): 327-460, pls. 21-24.

Oostinghe, C. H. 1938-1939. ‘Die Mollusken des Pliocans von Sud-Bantam in Java,’ 2. Abschnitt (Gastropoda II) mit Tafeln VIII-XVI. Druk van G. Kolff & Co. Batavia, Centrum.

Perry, G. 1811. Conchology, or the Natural history of shells, Containing a New Arrangement of the genera and species, illustr. By coloured engravings executed from the Natural Specimens, and including the latest Discoveries. Pp. 1-4, pls. 1-61.

Petit de la Saussaye, S. 1851. Notice sur le genre Marginelle, *Marginella* Lamarck, suivie d'un catalogue synonymique des espèces de ce genre. *Journal de Conchyliologie* 2: 38-59.

Redfield, J. H. 1851. *Catalogue of Marginellidae*, In the Collection of John H. Redfield. 2 pp. Privately printed. N.Y.

Redfield, J. H. 1870. Catalogue of the known species, recent and fossil, of the family Marginellidae. *American Journal of Conchology*, 6(2): 215-269.

Reeve, L. A. 1864-1865. Monograph of the genus Marginella in *Conchologia Iconica: or illustrations of the shells of molluscous animals* (15), pls. 2-13 [Aug. 1864], pls. 1, 14-27, index, errata [Jan, 1865].

Souleyet, L.F.A. 1852. ‘Mollusques’, in F. Eydoux & L.F.A. Souleyet, 1852 ‘Zoologie’, in ‘Voyages autour du Monde exécuté pendant les années 1836 et 1837 sur la corvette ‘La Bonite’ commandée par M. Vaillant Capitaine de Vaisseau publié par ordre du gouvernement sous les auspices du Département de la marine’. 2:1-664. Atlas pp. 2-8, pls. 1-45, Arthus Bertrand, Paris.

Sowerby, G. B. 2nd, 1846. Monograph of the genus Marginella *in* Thesaurus Conchyliorum, or Figures and Descriptions of Recent Shells 1(7): 239-406, pls. 68-78, Sowerby, London..

Tomlin, J. R. Le B. 1917. A Systematic list of the Marginellidae, *Proceedings of the Malacological Society of London*, 12 (5): 242-306.

Troschel, F. H. 1867, in 1865-1893. *Das Gebiss der Schnecken zur Begrundungeiner Naturlichen Classification,* 2: 1-409, pls. 1-32. G. Parthey, Berlin.

Tryon, G.W. 1882-1883, *Manual of Conchology* 5:5-58, 197-198. Philadelphia.

Wagner, R.J.L. & Abbott, R.T. 1967. Van Nostrands Standard Catalogue of Shells, 2nd ed. Van Nostrand Co. Princeton, N.J.

Wallace, A. R. 1855. 'On the Law Which Has Regulated the Introduction of New Species'. *Annals and Magazine of Natural History*. 16 (2nd series): 184 – 196.

Weinkauff, H.C. 1879. Die Gattungen *Marginella* und *Erato*. *Systematisches Conchylien-Cabinet* 5(4): 1-166. Nuremberg.

NOTE AUX AUTEURS

Conditions Générales. L'affiliation à la Société n'est pas obligatoire pour les auteurs. La publication des articles de maximum 12 pages imprimées en double interligne est gratuite. Au-delà de 12 par numéro, chaque page sera facturée au prix de 40,00 €. Les articles de taille supérieure peuvent être scindés sur plusieurs numéros.

Les numéros hors série sont publiés irrégulièrement. Les auteurs désireux de soumettre un article pour un numéro hors série (40 pages imprimées ou plus) sont priés de contacter auparavant la Société Belge de Malacologie à l'adresse ci-dessous.

Les articles décrivant de nouvelles espèces (sous-espèces) ne seront acceptés que si le matériel type primaire est déposé dans un Musée ou une Institution scientifique publique.

Les auteurs devront suivre strictement les règles du *Code de Nomenclature Zoologique* (quatrième édition).

Manuscrits. Les manuscrits seront rédigés en français ou en anglais. Ils doivent être dactylographiés, justifiés à gauche, avec double interligne, sur une seule face de papier A4 et sur une colonne. Les marges doivent être de 25 mm minimum. La séquence des sections respectera l'ordre suivant : titre, nom de(s) auteur(s), adresse(s) de(s) auteur(s), mots-clés et résumé en anglais (et éventuellement en français). Les noms de genre et des (sous) espèces seront en caractères *italiques*. Les références dans le texte auront la forme: Keen & Campbell (1964) ou (Keen & Campbell, 1964). **Consultez un numéro récent de Novapex pour l'organisation du texte.**

La liste des références, en ordre alphabétique, respectera la forme suivante (les titres des publications ne devraient pas être abrégés):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.
Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells.* William Collins Publishers Ltd: xiv + 500 pp.
Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
Source Internet:
Auteur(s) 2007. Titre du site web ou de la base de données, nom de l'éditeur et localité (si indiquée), nombre de pages, adresse: http://www.... (date d'accès).

Illustrations. Les photographies doivent être de bonne qualité (couleur ou noir/blanc), imprimées sur papier brillant et montées sur un support adéquat dans le format final souhaité (max. 16 X 21 cm). Des photographies en couleur peuvent être soumises pour une reproduction en noir et blanc. Les illustrations peuvent également être fournies sur un support informatique (CD-ROM, ZIP) en format PSD (Photoshop) BMP, JPG ou TIFF avec mention du programme utilisé. Elle doivent être montées et ne peuvent contenir aucun texte, sauf la numérotation. Une version imprimée des planches doit être impérativement jointe au manuscrit.

Si plus d'une figure apparaît sur une planche ou/et dans le texte, TOUTES les figures doivent être numérotées consécutivement (Fig. 1, 2, 3...) ET PAS Fig 1A, 1B, 1C, NI planche 1, Fig. 1...

L'inclusion de planches couleurs est soumise à l'approbation du conseil d'administration qui prendra la décision finale. Les auteurs désireux d'inclure une ou plusieurs planches couleurs sont priés de se renseigner quant aux possibilités offertes et aux coûts.

Traitement des manuscrits. Les manuscrits seront soumis au conseil d'administration qui distinguera les articles d'intérêt scientifique et ceux d'intérêt général. Les décisions et les commentaires seront communiqués aux auteurs, qui en tiendront compte. La version corrigée devra être renvoyée à la Société Belge de Malacologie sous forme informatisée (en Word pour Windows) accompagnée d'un tirage sur papier. Elle devra respecter strictement les instructions de mise en page qui auront été communiquées aux auteurs. Une épreuve finale sera renvoyée aux auteurs pour correction.

Tirés-à-part. En ce qui concerne les articles d'intérêt scientifique, 30 exemplaires sont gratuits, jusqu'à concurrence de 240 pages maximum, si au moins un des auteurs est membre de la Société. Les exemplaires supplémentaires (min. 30 exemplaires) seront facturés au prix coûtant.

Pour les non membres, les tirés-à-part sont à charge des auteurs, au prix coûtant (minimum 30 exemplaires). Les frais de port sont toujours à charge des auteurs.

Les manuscrits et toute correspondance seront adressés à:
Société Belge de Malacologie, M. C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye, Belgique
ou par e-mail: vilvens.claude@skynet.be

NOTE TO AUTHORS

General conditions. Membership is not mandatory for authors. Publication of papers with a maximum of 12 double spaced printed pages is free of charge. Beyond 12, every page will be invoiced at the price of 40,00 €. Larger papers may be splitted on several issues.

Supplements are published irregularly. Authors wishing to submit papers for supplements (40 printed pages or more) are asked to contact the board previously at the address mentioned below.

Papers describing new species (subspecies) will be accepted only if the primary types are deposited in a recognized public Museum or scientific Institution.

The paper will be in accordance with the rules of the *International Code of Zoological Nomenclature* (Fourth edition)

Manuscripts. Manuscripts will be in English or in French. They must be typed on one column, ragged right (left-justified), double-spaced throughout, on one side only of A4. Margins must be at least 25 mm. The sequence of sections will respect the following order: title, name of author(s), address(es) of author(s), keywords and summary in English. Generic and (sub)specific names have to be typed in *italics*. References in the text should be given as follows: Keen & Campbell (1964) or (Keen & Campbell, 1964). **Refer to a recent issue of Novapex for the lay out.**

References, in alphabetic order, should be given in the following form (titles of journals should not be abbreviated):

Keen, A.M. & Campbell, G.B. 1964. Ten new species of Typhinae (Gastropoda : Muricidae). *TheVeliger* 7(l): 46-57.
Powell, A.W.B. 1979. *New Zealand Mollusca. Marine, land and freshwater shells.* William Collins Publishers Ltd: xiv + 500 pp.
Mayr, E. 1989. Attaching names to objects. In: *What the philosophy of biology is : essays for David Hull* (M. Ruse, ed.), Klumer Academic, Dordrecht: 235-243.
Internet resources.
Author(s) 2007. Title of the website or database, publisher name and locatiuon (if indicated), number of pages, address: http://www.... (date of access).

Illustrations. Photographs must be of a high quality (colour or black/white), printed on glossy paper in a final version (max. 16 X 21 cm), adequatly mounted. Colour work can be submitted for black & white production. The illustrations may be submitted as digital files (CD-ROM, ZIP) in BMP, JPG or TIFF format, with mention of the program. They must be adequately mounted with not any other text than the numbering. A printed version of the plates must be imperatively sent together with the manuscript.

If more than one figure is included in a plate or/and in the text, ALL figures must be consecutively numbered (Fig. 1, 2, 3...) NOT Fig 1A, 1B, 1C, NOR plate 1, Fig. 1...

Inclusion of colour plates has to be approved by the board who will take the final decision. Authors who want to include colour plates are invited to ask for possibilities and charges.

Processing of manuscripts. Manuscripts will be submitted to the board who will distinguish between the articles of scientific interest, and those of general aim. The comments will be communicated to authors, who will consider them. A diskette containing the corrected version should be sent back to the Belgian Malacological Society (in Word for Windows support) together with a printed copy. It should strictly follow the style instructions which will be communicated to the author(s).

Reprints. With regard to papers of scientific interest, 30 reprints are free of charge, representing a maximum of 240 pages, if at least one author is member of the Society. Additional copies (at least 30) will be invoiced at cost.

For non-members, the reprints (min. order 30 copies) will be billed to the author(s). Mailing costs are always to be paid by authors.

Manuscripts and any mail are to be sent to:
Société Belge de Malacologie, Mr. C. Vilvens, rue de Hermalle, 113, B-4680 Oupeye, Belgium
or by e-mail: vilvens.claude@skynet.be

SOMMAIRE DES NUMEROS HORS SERIE DE NOVAPEX DEJÀ PARUS

NOVAPEX VOL. 4 (HS n° 1) 10 Février 2003

New records of Indo-Pacific Epitoniidae (Mollusca: Gastropoda) with the description of nineteen new species. Emilio Fabián GARCIA
(uniquement disponible en PDF) Prix : 8 euros

NOVAPEX VOL. 5 (HS n° 2) 10 Février 2004

A review of *Gemixystus* Iredale, 1929 (Gastropoda: Muricidae) from Australia and New Zealand. Roland HOUART
Prix: 9 euros

NOVAPEX Vol. 6 (HS n° 3) 10 Juin 2005

Problèmes taxonomiques du complexe *Laevicardium oblongum-crassum* (Mollusca: Bivalvia: Cardiidae). Jacques VIDAL
Prix : 20 euros

NOVAPEX Vol. 7 (HS n° 4) 10 Octobre 2006

Descriptions of new species of Pacific *Cystiscus* Stimpson, 1865 (Gastropoda : Cystiscidae) Part 1: species with banded mantle patterns. Andrew WAKEFIELD and Tony McCLEERY
Prix : 16,50 euros

NOVAPEX Vol. 8 (HS n° 5) Juin 2007

New species and new records of *Calliotropis* (Gastropoda: Chilodontidae: Calliotropinae) from Indo-Pacific. Claude VILVENS
Prix : 21,60 euros

NOVAPEX Vol. 9 (HS n° 6) Février 2008

The morphology of conglutinates and conglutinate-like structures in North American freshwater mussels: a scanning-electron microscopy survey. G. Thomas WATTERS
Prix: 6 euros